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NSF RFP NO. OPP 98001

SCIENCE, OPERATIONS AND MAINTENANCE SUPPORT FOR THE UNITED STATES ANTARCTIC PROGRAM (USAP)

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SECTION A -- SOLICITATION/CONTRACT FORM

A1. GENERAL INFORMATION

Section L of this solicitation contains important information about the preparation of proposals for this acquisition. Offerors are expected to examine the schedule and all instructions and to furnish the information required by this RFP.

A2. ISSUING OFFICE

This RFP is issued by the Division of Contracts, Policy, and Oversight of the National Science Foundation which is the only point of contact for this procurement. Proposals and any inquiries concerning this solicitation must be submitted in writing to the following:

National Science Foundation
Division of Contracts, Policy, and Oversight
4201 Wilson Boulevard, Room 475
Arlington, Virginia 22230
ATTN: Mr. Bart Bridwell
Contract Specialist

All proposals **MUST** be labeled as follows:

Mailroom: DO NOT OPEN (RFP OPP 98001)

Deliver Directly to Room 475

If hand carried, proposals should be delivered **DIRECTLY** to the room number identified above once examined by security personnel.

Inquiries regarding this solicitation should be submitted in writing. NSF will respond to the inquiries within fourteen days. Facsimile transmission of questions is permissible, and may be directed to Mr. Bridwell at (703) 306-0280 or (703) 306-0780.

A3. RECEIPT OF PROPOSALS AND LATE SUBMISSIONS

Proposals, including modifications, received at the issuing office after the closing date and time specified on the cover page of this solicitation will be considered as late submissions and handled accordingly.

As used in the referenced FAR provision titled "Late Submissions, Modifications, and Withdrawals of Proposals," the term "mail" does not include materials sent by means of express delivery services other than U.S. Postal **Service Express Mail Next Day Service-Post Office to Addressee**. Proposals submitted by means of express delivery services other than the U.S. **Postal Service Express Mail Next Day Service - Post Office to Addressee** will be considered the same as hand carried submissions.

THE GOVERNMENT WILL UNDERTAKE REASONABLE SECURITY PRECAUTIONS FOR ALL INDIVIDUALS AND PACKAGES ENTERING THE FACILITY. ENTRANCE TO NSF IS RESTRICTED

AND EXTRA TIME SHOULD BE ALLOWED FOR ADMISSION. IF HAND-CARRIED, PROPOSALS SHOULD BE DELIVERED DIRECTLY TO THE ROOM NUMBER IDENTIFIED HEREIN, AFTER THE PACKAGE IS INSPECTED AND PASSED THROUGH NSF SECURITY PROCEDURES. NO PACKAGE WILL BE ACCEPTED UNTIL IT IS INSPECTED.

A4. USAP INFORMATION CONFERENCE

An information conference has been scheduled for September 15-17, 1998, beginning at 1:00 pm local time in Room 1235 at the National Science Foundation facility located at 4201 Wilson Boulevard, Arlington, VA. At this time NSF will make presentations regarding current USAP activities. Interested parties will be permitted to ask questions. Attendance at this conference is encouraged for participation in this solicitation.

Confirmation of the intent of an organization's representatives to attend the conference shall be submitted in writing by August 31, 1998 to the address identified in Item 7 on the solicitation cover page (ATTN: Mr. Bart Bridwell). This correspondence shall identify all individuals attending. Should space become a problem NSF, at its discretion, shall reduce the number of participants.

A5. SITE VISIT

A site visit to Port Hueneme, CA; Christchurch, NZ; McMurdo Station, Antarctica; Amundsen-Scott South Pole Station, Antarctica; and selected field locations is scheduled for December 1998. Participation is limited to two individuals per organization. Access to certain sites may be limited to one individual per organization. NSF will provide air transportation between Christchurch, NZ and McMurdo Station, Antarctica; and all extreme cold weather gear, transportation, food and lodging while deployed to Antarctica. The cost per individual for these services is \$____. All other food, lodging, transportation, and other expenses are the responsibility of the organization.

Confirmation of the intent of an organization's representatives to participate in the site visit shall be submitted in writing by October 1, 1998 to the address identified in Item 7 on the solicitation cover page (ATTN: Mr. Bart Bridwell), and should be accompanied by payment for services provided by NSF. Checks should be made payable to the National Science Foundation.

Participation in this site visit is contingent upon medical and dental qualification of an organization's personnel by the National Science Foundation. This process requires approximately two months to finish following receipt of properly completed examination forms. These forms will be provided as needed.

NSF is producing a videotape on its operations on board the Ice Breaking Research Vessels *Nathaniel B. Palmer* and *Laurence M. Gould*, and at Punta Arenas, Chile and Palmer Station, Antarctica. The video tape and other site visit details will be provided at a later date.

A6. PREPROPOSAL CONFERENCE

A preproposal conference has been scheduled for February 2, 1998 at 9:30 am local time in Room 1235 at the National Science Foundation facility located at 4201 Wilson Boulevard; Arlington, Virginia. Attendance at the conference is encouraged for participation in this solicitation.

Confirmation of the intent of an organization's representatives to attend the conference shall be submitted in writing by January 15, 1998. This correspondence shall identify all the individuals attending. Should space become a problem NSF, at its discretion, shall reduce the total number of participants.

A7. NOTICE OF SET-ASIDE

This procurement is unrestricted.

A8. BASIS FOR AWARD

The evaluation criteria for award are listed in Section M of this solicitation. Award will be made on an all-or-none basis.

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SECTION B – SUPPLIES OR SERVICES AND PRICES/COSTS

B1. SCHEDULE OF ITEMS

The Contractor shall provide science, operations and maintenance support services for the United States Antarctic Program (USAP), this nation's scientific research program in the Antarctic. The actual services provided shall be determined yearly in accordance with Program Plan accepted annually by NSF (refer to Section F).

B2. CONSIDERATION (COST-PLUS-AWARD-FEE SERVICES)

[to be added at a later date]

B3. COMPENSATION

The costs of performance of this contract are defined as the necessary direct costs incurred during the period of performance of this contract, and an amount for overhead in accordance with the provisions of Section B3.2, *Indirect Costs*. Allowability of costs and cost allocation method shall be determined in accordance with Part 31 of the Federal Acquisition Regulations and the terms of this contract.

B3.1 Direct Costs

B3.1.1 Travel -- Including subsistence may be charged to this contract in accordance with Contractor's established policy subject to the limitations of FAR Subpart 31.205-46.

B3.1.2 Consultants -- Payment for the services of consultants shall not exceed \$453 per day per consultant, nor exceed \$13,590 to any individual in any twelve (12) month period without the prior written approval of the Contracting Officer. Requests by the Contractor for authorization to pay in excess of \$453 per day or \$13,590 total to any one individual shall contain the following information:

B3.1.2.1 A biographical sketch, including education and professional experience of the consultant;

B3.1.2.2 A description of the services the consultant will perform, the estimated level of effort, and period of performance;

B3.1.2.3 A schedule of previous rates paid to the consultant by the Contractor and/or other organizations for similar services for a like period;

B3.1.2.4 A determination the proposed not-to-exceed amount is fair and reasonable, including the basis for this determination.

B3.1.3 Equipment -- For the purposes of this section only equipment is defined as any item of property which has an acquisition cost greater than or equal to \$2,500, and an expected service life of two years or more. Unless prior written permission of the cognizant NSF WBS Manager is obtained no costs may be charged to this contract for:

B3.1.3.1 Any item of general purpose equipment, including but not limited to: office furnishings, personnel computers or other information technology, reproduction or printing equipment, and motor vehicles.

B3.1.3.2 Any other item of equipment with an acquisition cost greater than or equal to \$5,000.

B3.1.4 Leases -- Unless prior written permission of the Contracting Officer is obtained no costs for leasing property (both real and personnel) may charged to this contract.

B3.1.5 Subcontracts -- Consent to subcontract shall be obtained in accordance with the clause in this contract titled *Subcontracts Under Cost-Reimbursement and Letter Contracts*.

B3.1.6 Limitation on Costs Related to Legal and Similar Matters

B3.1.6.1 Definitions -- As used in this subsection only, the following terms shall have the meaning set forth herein.

B3.1.6.1.1 *Costs* has the same meaning as set forth in FAR Subpart 31.205-47(a).

B3.1.6.1.2 *Damages* means any and all monetary compensation awarded to individuals, businesses and/or governments.

B3.1.6.1.3 *Proceeding* means any action, hearing, investigation, inquest or inquiry (whether conducted by a court, administrative agency, hearing officer, arbitrator, or any other person authorized by law) in which, pursuant to law, testimony can be compelled to be given. It also includes any means of alternate dispute resolution in which the Contractor is a participant.

B3.1.6.2 To the extent that certain costs related legal and other proceedings (including matters disposed of by compromise prior to judgement) are otherwise allowable per FAR Subpart 31, total costs (including costs for remedial actions) and damages (including, but not limited to payments of compensatory damages and back pay) charged to this contract shall not exceed \$ **[to be negotiated]**.

B3.1.6.3 This limitation shall not apply to those costs incurred as a result of compliance with specific terms and conditions of this contract or written instructions from the Contracting Officer.

B3.2 Indirect Costs

Pending modification(s) to this contract setting forth final indirect cost rate(s) in accordance with this contract's *Allowable Cost and Payment* clause the Contractor shall be provisionally reimbursed for indirect costs at following rates:

Rate Type	Cost Base	Billable	Ceiling
[to be negotiated]			

The final rate for reimbursement of indirect costs incurred during the period of performance of this contract shall be the Contractor's actual rate, but in no case shall the rate exceed the ceiling.

B4. CONTRACT FUNDING

Pursuant to the clause titled *Limitation of Funds* the total amount presently allotted to this contract for the performance of work is as follows:

Element	Existing	Earned Fee Adj	OPP-[TBD] ¹	Subtotals
Est. Cost	\$ 0	\$ 0	\$(TBD)	\$(TBD)
Billable Fee	\$ 0	\$ 0	\$(TBD)	\$(TBD)
Award & Base Fees	\$ 0	\$ 0	\$(TBD)	\$(TBD)
Total Allotted	\$ 0	\$ 0	\$(TBD)	\$(TBD)

It is estimated that these funds are sufficient for the performance of work through [to be determined].

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¹ TBD is an acronym for *to be determined*.

SECTION C – DESCRIPTION/SPECIFICATION/WORK STATEMENT

C1. SCOPE OF WORK

For the consideration set forth in the section titled *Consideration (Cost-Plus-Award-Fee Services)*, the Contractor (independently and not as an agent of the Government) shall provide all labor, materials, facilities and equipment (unless otherwise authorized by the Contracting Officer) to provide science, operations and maintenance support for the United States Antarctic Program.

C2. INTRODUCTION

The United States Antarctic Program (USAP) is funded and managed by the National Science Foundation (NSF), an agency of the Executive Branch of the Federal Government. The NSF organization tasked with this responsibility is the Office of Polar Programs (OPP).

The USAP is the national program for scientific research and geopolitical presence in Antarctica, the world's seventh and southernmost continent. By Presidential direction (Presidential Memorandum 6646, 1982), the United States maintains an "active and influential presence in Antarctica designed to support the range of US Antarctic interests." This presence includes "the conduct of scientific activities in major disciplines; year round occupation of the South Pole and two coastal stations, and availability of related necessary logistics support."

In 1994, Presidential Decision Directive NSC-26 reaffirmed the 1982 memorandum and announced four policy objectives including protection of the Antarctic environment and conservation of living resources in the oceans surrounding Antarctica. These environmental responsibilities influence the course of all current and future USAP activities in Antarctica.

To accomplish the USAP mission NSF funds a diversified science program in all major disciplines, coordinates the resources of other government agencies providing operational support to the USAP; and acquires and manages commercial contractors to support the science program and operate and maintain US facilities in Antarctica.

The annual USAP appropriation is in the range of \$200 million. A separate appropriation of \$128 million to construct a new station at the South Pole has been approved by Congress, and this funding will be made available in increments during the contract period.

C3. BACKGROUND

The USAP evolved from an expeditionary program begun by the United States prior to and during the worldwide International Geophysical Year (IGY) in 1957. With primary logistical and operational support provided by the US Navy, seven US stations - including a large support base at McMurdo Sound and a small research facility at the Geographic South Pole - were established in Antarctica. At the conclusion of the IGY, it was decided to maintain and expand the scientific program, keep several of the stations in operation indefinitely, and continue the US Navy's logistical support responsibility.

Beginning in the 1960s, certain science support and a few other functions were let to private contractors. In 1970, a National Security Memorandum shifted funding and management responsibility for the entire program to the NSF. During the 1970s and 1980s, contractors assumed more support roles, including operation of South Pole

Station, Palmer Station and a research vessel; program-wide construction tasking, information systems implementation, and major procurement responsibilities.

The shift to contractor support accelerated in the early 1990s with the Navy's phased and final withdrawal from the USAP, completed in 1998. Most functions performed by Naval Support Force Antarctica (NSFA) are now the responsibility of the incumbent contractor. The exceptions are LC-130 aircraft operations (formerly provided by Navy squadron VXE-6) which are the responsibility of the Air National Guard, and USAP air traffic control and McMurdo meteorological services, now performed by the Space and Naval Warfare Systems Center (SPAWARS), a US Navy command, under interagency agreements with NSF.

Heavy airlift capability (C-5 and C-141) for the USAP is provided by the US Air Force, although a commercial alternative is being contemplated. Icebreaker support is and will continue to be provided by the Department of Transportation (US Coast Guard).

Today, the USAP is largely supported by commercial contractors. The scope and type of services to be provided by the contractor acquired through this solicitation are explained in detail in Section C.7, the statement of work.

C4. STANDARDS AND REGULATIONS

This section will cite, by name, title and relevant passage, the federal codes and regulations, and industry codes to be followed by the contractor. NSF is currently determining the specific citations; however, the organizational format will be similar to the following:

Federal Citations

Presidential and NSC directives
NSF policies and directives
CFRs, including aviation (FAA) medical, safety (OSHA) and environmental references (ACA, NEPA, RCRA, etc.)
US Civil and Criminal Code references applicable to Antarctica (Jurisdiction, Privacy Act, IRS rulings, etc.)

International Citations

Antarctic Treaty and amendments
Other protocols followed by the US

Industry Citations

Building codes
Fire and Safety codes
Professional codes (medical, dental, engineering, etc.)
Maritime codes
Aviation codes

Other Citations

Selected USAP field procedures or reports with program-wide influence, as approved by NSF.
Specialty certifications (mountaineering guides, for example)

C5. FORMS, OTHER DOCUMENTS, AND DEFINITIONS

The first part of this section is procedural. NSF will identify the forms to be used by the contractor. These will include contractual and administrative forms (SFs) from Part 53 of the FAR, regulatory-type forms (hazardous waste manifests, etc.), permit applications, etc.

The second part is a list of definitions relating to performance (for example, a definition of the contractor as the “owner” of hazardous waste will be required) and a glossary of terms as they are used by USAP.

C6. SYSTEM DESCRIPTIONS

[To be added at a later date]

C7. STATEMENT OF WORK

C7.1 General

C7.1.1 Project Management

Contractor support of the United States Antarctic Program (USAP) requires system-type operations management skills and sustained, dedicated attention. The key management staff assigned by the successful contractor to this program must be full-time, year round employees with no collateral responsibilities for the duration of their assignment.

The contractor shall staff the project organization according to its best management practices and in a manner that provides logical, direct working interfaces with the National Science Foundation Office of Polar Programs (NSF/OPP). Although the responsibility, autonomy and specific duties to be assumed by individual employees are at the contractor’s discretion, NSF requires that the contractor designate “key personnel” for the functional areas of contract performance briefly described below. Qualifications for these individuals are presented in Section H-_. (Note: the word “executive” does not convey a job title the contractor is required to use nor does it necessarily dictate organizational seniority for any position other than “chief executive”).

Chief Executive - Directs the contractor organization. Establishes operating policies, coordinates the overall effort of all contractor functions including development of the annual program plan, and represents the contractor in negotiations and discussions with NSF. The Chief Executive shall have the authority to commit the contractor.

Science Support Executive - Manages the overall contractor effort required to directly support scientific research in Antarctica. Plans support of the annual science program with NSF, drawing support from contractor and other program agency operations, logistics and information systems groups. Fosters a contractor work environment that facilitates an understanding of science objectives.

Operations Executive - Manages the overall contractor effort required to operate and maintain the US stations and camps in Antarctica as well as the research vessels. Participates in development of the annual program plan with NSF and manages the contractor’s seasonal activities in Antarctica.

Logistics Executive - Manages the overall contractor effort required to supply US facilities in Antarctica, transport personnel and cargo to and from the continent, and operate program staging areas in the domestic US, New Zealand and South America. Participates in development of the annual program plan with NSF.

Information Systems Executive - Manages the overall contractor effort required to develop information technology (IT) strategy, objectives and standards for the USAP; devises and implements plans to improve the IT infrastructure, and applies IT systems to the collection and use of program operations data.

Engineering and Construction Executive - Manages the contractor's overall engineering and construction effort. Participates in development of the annual program plan with NSF. Oversight responsibility for the South Pole Redevelopment Project.

Other organizational positions are to be determined by the contractor according to the type and volume of work described herein as well as that proposed in annual program plans. In general, however, the contractor shall structure its workforce with only the employees and subcontractors needed to complete the annual program plan efficiently and cost-effectively. Similarly, as policy, the contractor shall develop plans to execute work with the smallest possible on-site staff at the stations, camps and onboard the research vessels while operating in compliance with USAP environmental, safety and health procedures.

C7.1.2 Contract Administration

The contractor shall provide the skills and knowledge to administer the prime contract with NSF and any subcontracts with its own organization according to the requirements of Sections G and I. The acquisition of subcontracted services under this contract shall conform to all applicable FAR clauses (see Section C.7.1.4).

The contractor shall also provide the administrative and, as needed, legal resources to meet the requirements of Sections C.4, C.5 and C.8. In general, the contractor shall assume the administrative burden of a contract of this size and scope in a manner that provides the NSF Contracting Officer and the Contracting Officer's Technical Representative(s) (COTR) with timely, accurate written information as required under the terms of the contract. Such information shall be clear, pertinent and succinct (see Section C.8).

C7.1.3 Planning and Review

Annual Program Plan - In ____ of each year, the contractor and NSF/OPP begin developing an annual program plan for the fiscal year starting on 1 October. The plan, prepared by the contractor after initial discussions with NSF/OPP are complete, consists of two volumes: a program cost schedule and narrative volume, and a staffing schedule and narrative volume. These volumes detail the contractor's staffing and work plans for the upcoming fiscal year according to budgeting assumptions that are provided to the contractor by NSF/OPP, and explain how the contractor will complete each programmed task within the budget target for the task.

Traditionally, the annual program plan has been constructed along functional lines that mirror the areas of management oversight responsibility at NSF/OPP, which is organized according to Activity Based Management (ABM) principles.

Negotiations and revisions follow, and NSF/OPP normally approves a program plan by ____ of each year. The contractor can then initiate hiring and procurement actions that have been pending approval.

The Air National Guard, SPAWARS and other support organizations also contribute to the annual program plan. Working with NSF, the contractor coordinates their involvement in the planning process and, in the case of air operations, helps develop detailed plans for the annual airlift schedule and aviation support.

There is a time conflict between the USAP operating season and the government fiscal year. The budgetary authority for projects that typically require many months of preparatory work may not be received until late in the planning process. Therefore, both the contractor and NSF must contend with sometimes difficult to manage workload "peaks", where normally sequential tasks such as procurement, transportation and field work are compressed and overlap.

Long Range Planning - As part of its management responsibility, NSF/OPP develops long-range plans for the USAP. While such plans provide a desirable framework for the program's future, they are difficult to implement because of the restraints imposed by the government appropriations process and revisions are inevitable. NSF is presently working on one such revision that should be in effect by the time the next contract is awarded. The contractor assists NSF with the development of these plans when requested. Contractor contributions in the past have included possible designs and estimates for a multi-year renovation of McMurdo Station.

Treaty Information - Under the terms of the Antarctic Treaty, treaty nations are required to provide an annual exchange of information related to their science and operational activities in Antarctica. NSF is responsible for ensuring that an accurate and timely report on US activities is developed for submittal by the Department of State to the other Treaty Parties. The contractor shall prepare draft sections of this report based on the operational and administrative records maintained by the contractor at NSF direction. Contractor provided information typically includes ship and aircraft schedules, station opening dates, personnel data, descriptions of station facilities and equipment, locations of refuges, movement of radioactive materials, etc., as prescribed under Articles III and VII(5) of the Antarctic Treaty. Draft sections of the report are due at NSF in ____ of each year.

C7.1.4 Procurement

The contractor is required to provide a complete procurement capability that meets applicable FAR requirements (see Sections H and I). The contractor procures general goods and services, as well as science program supplies and equipment, as explained below.

General - Procurement is a sustained, year-round process with workload peaks toward the end of the government fiscal year. In recent years, the contractor has processed over 9000 purchase orders annually. Most procurement is performed centrally by the contractor; however, local goods and services are also procured by the contractor offices in California, New Zealand and Chile.

Procurement can be a difficult responsibility. For obvious cost and volume reasons, it is USAP policy to use the resupply vessels to the maximum extent possible; therefore, annual station resupply orders, construction materials, vehicles, etc., must be procured in time to be staged at Port Hueneme for vessel shipment. At the same time, budgetary authority to purchase may not be forthcoming until near the end of the USAP procurement cycle, when the new fiscal year appropriation is approved. Other factors such as emergency requests, vendor scarcity for specialty equipment and long-lead times for certain items affect the speed and efficiency of the process.

Goods - Procurement of goods spans the acquisition of supplies ranging from common household items to large annual food inventories and a multi-million gallon fuel supply. Procurement requests generated by the stations, headquarters operations staff, and NSF must be reviewed, approved, researched, transferred to purchase orders and issued for bid as required. Any capital equipment request, defined by NSF/OPP as any item with an acquisition cost of \$1500 or more that performs work by itself, must first be reviewed with OPP before purchase.

Services - The contractor procures services by subcontract or, for short-term requirements, consulting agreements. These can range from operating functions at the stations (power and water generation at McMurdo is a current subcontract) to specialty inspection or test services (hazardous waste documentation, oil sampling) to vessel and aircraft charters (both research vessels, fixed wing aircraft, etc.). This procurement responsibility is more complex, often requiring legal review, formal solicitation and evaluation according to the FAR, and ongoing contracts administration after contracts and leases are in place (see Section C.7.1.2). The contractor must provide the skills to acquire subcontracts and leases efficiently, in compliance with law, and in the best interests of the government.

Science Programs - The contractor is responsible for procuring general laboratory stock supplies and for the acquisition and maintenance of laboratory instrumentation. These resources are provided for use by all science programs. Stock includes glassware, reagents, and other consumables. Instrumentation is purchased for general laboratory use at NSF direction, and is calibrated and maintained under service agreements between the contractor and manufacturers or vendors.

The contractor also procures material and capital equipment directly for individual grants (see Section C.7.4.2). Because of the volume of purchasing conducted as well as the vendor data base maintained by the contractor, grantees can often obtain better prices and service by procuring through the contractor rather than on their own or through a university. After NSF approval is received, the contractor works directly with the grantees to determine specifications, delivery dates, and transportation and packaging requirements (special containers, customs clearance, hazardous material documentation, etc.).

C7.1.5 Human Resources

The USAP relies more than most programs on effective human resources management. Many of the jobs offered by the contractor require extended deployment in Antarctica where living and working conditions are relatively austere and, for many people, unappealing. Although the program attempts to provide some of the amenities found in normal society (see Section C7.3.2.15), little can be done to change the essential nature or purpose of the stations and camps. They are not “communities” supporting permanent populations; rather they are functional job-sites and research centers staffed by transients, each with job responsibilities, for a predetermined period of time.

Therefore, a primary challenge for the contractor is to develop a human resources program that establishes accurate “profiles” for successful employment in Antarctica, identifies and recruits suitable candidates according to the needs of the annual program plan, and devises appropriate compensation and incentive packages to satisfy and retain employees.

Historically, entry-level or semi-skilled employment in Antarctica attracts young, outdoor oriented single people while the journeyman trades and professional/technical positions should be staffed by individuals with the same skills and work experience (and certification and licensing as needed; for example: MD, DDS, PE) required for such positions elsewhere. Employment agreements are to be determined by the contractor, but because operational performance in Antarctica is significantly improved when effective employees return, NSF/OPP desires a reasonable degree of workforce stability. To this end, bonus plans, performance incentives, career development and advancement opportunities, etc., are acceptable means of encouraging employee continuity. At the same time, workforce continuity is not an end in itself: ineffective employees returning to the program diminish operational efficiency as much as effective employees enhance it.

The contractor shall recruit, select and retain a full-time and seasonal workforce according to its management approach and annual program plan requirements. Employees shall be medically qualified as required for deployment to Antarctica (see Section C7.1.6.1), attend an appropriate contractor developed orientation program (USAP mission and policies), and receive specialized training according to their primary job assignment, work location and supplemental duties as assigned.

The contractor is responsible for the compensation and administration of all benefits for its employees according to applicable Federal employment laws and regulations. As required by Section K and EEOC requirements, the contractor shall implement and maintain non-discriminatory employment practices, and ensure an office and job-site work environment that is free of harassment for all employees.

C7.1.6 Medical Management

C7.1.6.1 Medical Screening Program

The NSF has issued regulations requiring all USAP participants deploying to Antarctica to meet certain medical, dental, and in some cases (winter-over staff) psychological screening criteria (see Section C4, CFR 45 675). The contractor shall establish and operate a system by which the medical qualifications (i.e., medical, dental, and psychological) of all civilian participants are reviewed against those standards, and a determination made whether each person is physically qualified (PQ'd) or not physically qualified (NPQ'd) for assignment in Antarctica. The contractor shall utilize the clearance criteria provided by NSF and apply those standards uniformly across all program participants, regardless of affiliation.

The medical status of each USAP participant is reviewed annually. The contractor shall implement a system which can provide a determination of PQ/NPQ status within 6 weeks of information submittal by the individual. About 2000 persons go through this clearance process annually, the majority in the months preceding the austral summer season.

The Contractor shall submit their screening process to NSF for review and approval (including qualifications of the personnel making PQ/NPQ determinations), since many of the determinations will involve medical judgment.

Annually or at NSF direction, the contractor shall review existing screening criteria for applicability to the program as well as medical/dental currency, and recommend additions/deletions that will improve and expedite the clearance process.

The contractor shall be responsible for the maintenance of accurate and complete medical screening records. Such records generated by the Contractor are NSF property, and are protected from inappropriate disclosure by the Privacy Act of 1974 (5 USC.552(a)). The contractor shall maintain medical records in compliance with Privacy Act requirements, and NSF policies and directives. USAP medical screening records shall be maintained separate from any records management system the contractor may develop for its own needs.

C7.1.6.2 Clinic Management

The contractor shall provide all necessary personnel, management, and supervision for the year-round operation of medical clinics at each of the three permanent research stations in Antarctica and for the oversight of all medical care rendered by emergency responders (e.g., Emergency Medical Technicians) by contractor staff. These operations shall provide essential medical care to all USAP personnel, regardless of affiliation, and to other personnel on a humanitarian basis.

Each of the three clinics shall provide medical care comparable to an emergent care/ambulatory care facility in the US. Clinic staff shall be experienced in providing diagnosis and treatment of most injuries and illnesses anticipated in the medically-screened USAP population, stabilization for transport to tertiary care facilities off-continent if the patient's needs exceed the capabilities of the clinic (if such evacuation is available), and routine health and wellness care. For emergent care situations, the clinics would approximate Level III Trauma facilities, as defined by the American College of Surgeons. For routine medical care situations, the requirements would reflect the needs of a relatively young (average age of ~35 years), healthy population. A description of current clinic facilities and historical caseload summaries are provided in the Report of the USAP Medical Care Review Panel.

The preparedness and competency of the health care providers to respond to emergent conditions is of critical importance, given the limitations of facilities/equipment in each clinic, the remoteness of the stations from advanced or sophisticated medical care, the unpredictability of aeromedical evacuation during austral summer periods, and the complete physical isolation of station inhabitants for significant portions of the year. The contractor shall ensure through in-service training and evaluation of equipment and facilities that the clinic staff is prepared to respond to all aspects of emergent and routine care pertinent to USAP operations in Antarctica (e.g., hyperbaric medicine, cold injuries). The contractor shall describe in his proposal how the proposed staff obtained this competency and how it will be maintained.

NSF has determined the basic capabilities of the medical care system in the USAP (refer to the Report of the USAP Medical Care Review Panel). The contractor shall demonstrate how those capabilities will be provided, and how the quality of those capabilities will be maintained to US standards of medical care.

In addition to direct medical services, the contractor shall offer counseling/assistance services, public health/sanitation oversight, and participant wellness programs (although not necessarily via the medical clinic operations). The purpose of these programs is to manage problems that might affect adversely on USAP participant performance, productivity, or "quality of life" conditions.

Within the first year of contract operations, the contractor shall review, revise when necessary and submit for approval the clinics' Operations Manuals (and revised annually thereafter). The manual shall delineate staffing, general responsibilities, standards of conduct, clinic procedures, and protocols. A definitive quality assurance/quality control/quality improvement program shall be included. The Contractor should use Joint Commission on the Accreditation of Health Care Organizations (JCAHO) and other consensus standards for guidance.

C7.1.7 Quality Control

The contractor shall establish and enforce a suitable Quality Control (QC) program as an element of contract performance. The QC program shall incorporate relevant features of ISO 9001 or equivalent standards.

Although the prominence and content of a QC program within the overall contractor organization is to be determined by the contractor, NSF/OPP expects the program to be directed toward achieving the performance standards described in Section C.9. QC success will be defined as the contractor's sustained ability to meet or exceed performance criteria, and to correct deficiencies before the USAP mission is negatively affected. More amorphous QC initiatives, such as continual process reviews or corporate "culture" studies, are considered less important than the demonstrated ability to perform.

C7.1.8 Safety, Environmental and Health (SEH) Management

USAP operations in Antarctica shall be conducted according to appropriate occupational and environmental health and safety policies and practices, as detailed in the USAP Safety and Health Policy Manual. The USAP has adopted the performance basis of US regulations, standards and consensus guidelines, modified as appropriate for the Antarctic environment. USAP policies are comprehensive, encompassing industrial/occupational and laboratory/research work areas, underwater diving, aviation, marine/ship operations, hazardous materials/waste, radiation (ionizing and nonionizing), mountaineering/wilderness/cold weather survival, vehicular/heavy equipment operation, public health/sanitation, fire protection/security, and emergency response.

The contractor shall ensure that these policies are recognized and suitable controls incorporated into all contract activities in order to mitigate known hazards. The contractor shall establish an internal safety and health program for its employees, similar to that required of employers in the US, that implements these policies throughout the organization. In general, such a program shall be consistent with OSHA requirements but tailored to the Antarctic work environment.

C7.1.9 Environmental Protection

NSF is responsible for conscientious stewardship of the Antarctic environment and for conducting science and support activities in ways that minimize or mitigate human impact on that environment. The specific requirements to accomplish this derive from the Antarctic Treaty and were given effect in the United States by the Antarctic Conservation Act (ACA) of 1978 (PL 95- 541). The ACA was amended by the Antarctic Science, Tourism and Conservation Act of 1996 to incorporate the requirements of the Protocol on Environmental Protection to the Antarctic Treaty. NSF is also responsible for enforcement of the ACA and its implementing regulations.

Several program-wide environmental measures are managed by the contractor at NSF's direction, and some contractor activities require permits. These are described below.

Environmental Review of Planned Actions - The contractor is responsible for assuring that environmental reviews are conducted for all planned activities before they are implemented. Environmental review procedures consistent with the National Environmental Policy Act (NEPA) as described in 40 CFR (1500-1508) and in 45 CFR 641 shall guide the contractor in the preparation of environmental documents for all planned actions in Antarctica.

The contractor shall, in close coordination with the NSF, collect project engineering and cost data, assemble planning information, propose appropriate mitigating measures, and prepare draft environmental documentation.

Contractor personnel preparing such information shall possess the background required for environmental impact assessment as well as appropriate written and verbal communication skills.

It is the responsibility of the federal official designated by NSF to review the adequacy of all environmental documentation and proposed mitigating measures provided by the contractor before implementing any decision that may impact the Antarctic environment.

Conservation of Antarctic Animals and Plants (45 CFR 670) - 45 CFR 670 regulates all activities related to Antarctic fauna and flora. Permits are required for taking of any native mammal or bird (including any disturbances incidental to station or science support activities); entry into designated protected areas; possession, transfer, or import into or export from the United States of native plants, mammals or birds; or introduction of non-native species. NSF is the issuing authority for permits required under these regulations.

The contractor will be responsible for applying for and obtaining all necessary permits required under 45 CFR 670 and with meeting all permit conditions. Permits are currently in place for a variety of activities the contractor is required to perform. These include: permits for entry into protected areas for maintenance of survival caches or for access to scientific equipment, and permits for removal of animals (taking) on runways and piers.

Waste Management (45 CFR 671) - 45 CFR 671 regulates the use or release of any designated pollutant (designated pursuant to 45 CFR 671, Subpart C) or the release of any waste in Antarctica. All such activities must be permitted. NSF is the permit issuing authority. The contractor shall be responsible for applying for and obtaining all necessary permits required under 45 CFR 671 and with meeting all permit conditions.

For wastes designated for removal from Antarctica and importation into the United States, the contractor is responsible for close coordination with federal and state regulators and for meeting the requirements of all applicable federal and state laws. For wastes disposed of in a foreign country, the contractor is responsible for ensuring that the requirements of that country are met. The contractor shall assume "ownership" of the waste (see Section C.5) generated by the USAP in Antarctica and is responsible for the correct handling, packaging, documentation, manifesting and disposal of waste under the NSF permit.

A master NSF permit for all USAP activities is currently in place. The permit covers removal and appropriate reuse, recycle or disposal, of all wastes from Antarctica, with the exception of sewage; contingency planning and spill response; proper management and record keeping of all hazardous materials used and all wastes generated, including low level radioactive wastes and medical wastes; access for inspection; and an annual report documenting details of these activities. The existing permit is transferable to the contractor with NSF's consent.

The contractor shall have appropriate experience with waste management procedures and associated regulations. Familiarity with the Pollution Prevention Act, the Solid Waste Disposal Act and the Resource Conservation and Recovery Act, the Toxic Substances Act; and the Comprehensive Environmental Response, Compensation and Liability Act is required.

C7.1.10 Technology Applications

The contractor shall conduct investigations, either on its own initiative or at NSF direction, to discover new and/or untried technologies that could benefit USAP operations. Such investigations may include new communications equipment and systems, new construction materials and methods, improved facility and equipment maintenance programs, remote sensing possibilities, new polar vehicles and transportation methods, improved cold weather clothing, and better instrumentation for engineering and/or scientific use.

The contractor shall acquire the knowledge to conduct informed and purposeful investigations. An appropriate data base can be derived from the literature of Antarctic and Arctic engineering and research, attendance at trade shows and conferences, surveys of experienced polar scientists and operations staff, and trial use of products or materials in the polar environment. As requested, the contractor shall develop and implement appropriate test and evaluation procedures for promising technologies, report the results of such tests to NSF and recommend or

discourage operational use accordingly. Innovations which lead to less costly and more efficient operations at program offices and field sites are of particular value.

C7.1.11 Media Programs and Publications

The contractor works with NSF to develop and disseminate USAP-related publications. As requested by NSF, the contractor also coordinates speaking engagements on USAP activities. These efforts are part of a general NSF public relations program that responds to the interest in the USAP and NSF expressed by media, schools, and public organizations.

The contractor prepares, prints and updates several quality handbooks which are primary USAP references. These include the Personnel Manual, Field Manual and Science Support Summary. The first two are revised as needed while the third is an annual publication (see Section C7.4.2). NSF may also request the preparation and printing of other booklets and brochures appropriate for public dissemination.

The contractor shall also be responsible for “internal” media services as approved by NSF. These may include publication of a biweekly USAP newspaper, the *Antarctic Sun Times*, creation of informational videos and guide books, and press releases to employees’ home town newspapers.

All publications and related activities for public dissemination of information on behalf of NSF are to be cleared with NSF’s Office of Legislative and Policy Analysis (OLPA) prior to distribution or presentation.

C7.2 Logistics

C7.2.1 Management

Logistics support is central to the success of the USAP. Everything required to sustain life in Antarctica must be imported while any planned activity on the continent or onboard a research vessel is totally dependent on a logistics network that spans, at its furthest reaches, over 10,000 miles.

“Logistics” as defined in this solicitation means the contractor management responsibility to move program participants to and from Antarctica; transport the supplies and equipment needed to operate the stations, camps and vessels; control inventories at the stations; and operate and maintain staging areas in California, New Zealand and Chile.

The contractor shall provide the management skills and organization required to provide a high standard of logistical support for operations in Antarctica. This will include an appropriate headquarters staff; local management and staff at Port Hueneme, California; Christchurch, New Zealand; and Punta Arenas, Chile; and field management and staff at the Antarctic stations.

The skill mix and reporting relationships within the logistics organization as well as the interaction with other contractor functions will depend on the contractor’s management approach. In general, however, the contractor’s logistics management personnel shall take an active role in preseason planning, provide logistics guidance for contractor operations, grantees and other USAP agencies; and provide NSF with the informed judgment and overall review needed to assess the effectiveness of USAP-wide logistics planning, transportation and inventory systems.

In recent years, computer technology and satellite communications have enabled the USAP to apply electronic tracking and control to personnel and cargo movement. These systems link the Antarctic stations with contractor headquarters, the Port Hueneme terminal and the Christchurch and Punta Arenas offices. Both systems are GFE and are managed by the contractor. Operation, maintenance and, as appropriate, upgrade of the systems will be a continuing responsibility under the next contract.

The following sections describe the key contractor logistics functions

C7.2.2 Material Control and Requisitioning

The contractor is responsible for the storage, control, issue and restocking of supplies at the Antarctic stations is an important contractor responsibility. Secure warehousing space at the stations is limited, and much of the inventory - particularly bulk commodities such as lumber and bottled gasses as well as some spare components like large tractor parts - is maintained outside on marked supply lines.

Materials are procured according to the operational requirements and budgetary allowances of the requisitioning departments. The logistics organization does not control the material requesting process; however, it is responsible for establishing ordering and shipment deadlines, for ensuring that all USAP participants understand the logistics process; and for controlling the movement, storage and issue of material.

Over the years, inventory control at McMurdo, South Pole and Palmer stations has improved. Most of the inventory is carried on a computerized listing which is regularly updated throughout the year according to the demand for various line items. Some _____ thousand line items are carried on the McMurdo inventory with similar types of supplies, proportionally adjusted for population and usage levels, maintained at South Pole and Palmer.

Material and equipment inventories are controlled with bar coding, where possible, and by manual posting when bar coding cannot be used (dry air, outside temperatures and UV light sometimes render bar codes unreadable). Some of the inventory is linked to the MAPCON maintenance management program (see Section C.7.3.2.3) used at all of the stations. The next contractor will continue computer-based inventory control practices. Software improvements are acceptable as long as the current data base is transferable. See Sections C.7.3.2.6 and C.7.5 for information on the computer programs used in inventory control.

C7.2.3 Property Administration

The contractor administers government furnished and owned property under this contract. This includes capital equipment and real property procured, used and/or installed at the contractor's domestic and international offices as well as the Antarctic stations and onboard the research vessels.

C7.2.3.1 Real Property Inventory

Real property is defined as the installed facilities (buildings and other structures and utilities) constructed at the US stations, and leased facilities in the domestic US (Port Hueneme office/warehouse), Christchurch, New Zealand (facilities at the International Antarctic Center and Harewood Airport), and Punta Arenas, Chile (office/warehouse space).

The contractor is responsible for providing an annual inventory of the location, value, use and condition of all real property including any changes thereto (modifications, removal from inventory, etc.).

C7.2.3.2 Capital Equipment Inventory

Capital equipment is defined as any item with an acquisition cost of \$1500 or more that performs work by itself. Capital equipment includes vehicles; installed or portable machinery such as drills, balers, compressors, winches, welders and generators; some computers, radios and other electronic equipment; and laboratory equipment.

The contractor is responsible for providing an annual inventory of the location, value (including depreciation) use and condition of all capital equipment with any changes thereto (additions to or deletions from inventory, changes in locations, etc.).

Capital equipment, including replacements for approved capital items, cannot be procured by the contractor without written NSF approval. The contractor must submit a written justification explaining the need for an item along with prices from three vendors.

C7.2.4 Travel Services

Every year, over ____ USAP participants travel to and from Antarctica through New Zealand or South America. Throughout the year, a number of contractor employees travel to other destinations on USAP business. At the direction of NSF, the contractor also arranges various conferences and related travel for program participants.

The contractor is responsible for providing all commercial airline ticketing, customs information and travel itineraries as required to fulfill the annual program plan. Because of the large and predictable volume of USAP commercial air travel, particularly to New Zealand, the contractor is in a position to secure rates and conditions favorable to the Government. The contractor is expected to negotiate such agreements with commercial air carriers and periodically review their value and effectiveness. US-owned carriers (and their international partners) are to be used except in those cases where US carriers or partners do not service a particular route or location.

The contractor also provides all motel and, as required, rental car and other local transportation arrangements for its employees and, when requested and authorized by NSF, other USAP participants on program business. Motel arrangements in New Zealand and changes to travel itineraries are coordinated by the Christchurch office. Similar arrangements in South America are handled by the local agent, currently AGUNSA.

Each year, the contractor organizes an annual operations planning conference and a variety of smaller user meetings and functional planning conferences. The contractor arranges meeting and hotel facilities and makes travel arrangements as needed for these conferences.

Section J, Attachment J- __ provides workload data for travel to and from New Zealand, travel to and from South America, travels to other international locations, and travel within the domestic US. Peak booking periods are included.

C7.2.5 Port Hueneme Terminal Operations

Port Hueneme, California, a deep water port approximately 60 miles north of Los Angeles, is the current domestic terminal for cargo shipped to and from Antarctica. The Port Hueneme office receives, packs and ships cargo destined for Antarctica; coordinates the use of military and commercial air and sea carriers, manages retrograde cargo returned from Antarctica, and ensures that hazardous/dangerous cargo is controlled according to national and international regulations.

The Port Hueneme office and warehouse is located in Building 471 at the Naval Construction Battalion Center, Port Hueneme. NSF leases the building from the US Navy. The building contains ____ SF of office space and ____ SF of warehousing space adjacent to a pier and cargo staging areas.

The most active period at Port Hueneme parallels the Antarctic austral summer - September to March of each year, with a peak during the December-January timeframe when the annual resupply ship is loaded - but sustained operations are in progress year round. The busiest time of year for USAP logistics in general and Port Hueneme in particular coincides with the domestic and international holiday season. Transportation and vendor response delays are common during this period; therefore, the contractor must plan procurement and transportation accordingly.

Contractor responsibilities are described below.

C7.2.5.1 Cargo Processing

Port Hueneme processes all cargo bound for continental and peninsular Antarctica. This includes reception, inspection, reconciliation, repackaging as needed, and documentation of cargo. Packing and crating for shipment is coordinated with a civil service operation next to the warehouse. Port Hueneme also manages the use of domestic surface freight carriers. On average, Port Hueneme handles ___ million pounds of cargo each year.

Cargo is staged and moved according to the Required on Site (ROS) date. ROS, the date an item is needed in Antarctica, sets the priority for shipment and is assigned by the requesting USAP party (contractor, grantee or NSF or other government agency). However, the ROS date can be met only if the item is ordered, procured and shipped to Port Hueneme in time to meet aircraft or vessel loading deadlines. While the burden to identify requirements in advance and budget the time needed to get the required item(s) to Antarctica is each requester's responsibility, the contractor is responsible for ensuring that requesters are aware of critical dates and understand the different modes of transport including their respective costs and relative effectiveness.

C7.2.5.2 Cargo Tracking System (CTS)

Port Hueneme is the domestic terminal manager for the CTS, a computer-based cargo tracking system that links the Antarctic stations with contractor headquarters, Port Hueneme, and the New Zealand and Chile offices. CTS tracks cargo movement and provides the means to update and reconcile cargo operations on a daily basis. The system is GFE. Operation, maintenance and, as appropriate, upgrade of the system will be a continuing contractor responsibility. See Section C.7.5 for additional information on CTS.

C7.2.5.3 Air Cargo Operations

Port Hueneme coordinates US Air Force C-141 and C-5 MAC Channel and chartered Special Assignment Airlift Mission (SAAM) flights, the regularly or specially scheduled military transports that support summer operations in Antarctica. The office submits SAAM requests to the Air Force according to the annual program plan and develops USAP air cargo load plans to take advantage of allotted space. Port Hueneme also manages the use of commercial air transport as needed throughout the season for shipment of priority cargo from California to New Zealand.

C7.2.5.4 Sealift Operations

Port Hueneme coordinates USAP sealift operations. This includes coordinating the loading of early season (June-September) commercial vessels to New Zealand, loading the annual resupply vessel for Antarctica in late December (a Military Sealift Command charter); and loading USCG icebreakers and USAP research vessels, either at Port Hueneme or other domestic ports (Houston, Seattle). Port Hueneme also manages the use of all USAP sea containers, and coordinates the shipment and protection of cargo with special requirements (frozen food, science samples, science equipment, etc.)

C7.2.5.5 Frozen Samples

An important contractor responsibility is the reception, storage and onward transportation of ice cores and other frozen science samples returned from Antarctica. These samples are received at Port Hueneme when the resupply vessel returns (or sometimes at other ports if returned via USCG icebreaker), kept in cold storage and shipped by reefer truck to their destination, usually an academic institution. The contractor monitors, tracks and controls the entire operation, from departure at McMurdo to arrival at the final destination.

C7.2.5.6 Hazardous Cargo Operations

Port Hueneme ensures that hazardous/dangerous cargo is properly documented, packaged and shipped according to applicable IATA, _____ and military regulations.

C7.2.5.7 Retrograde Cargo Operations

Port Hueneme handles reception, reconciliation and distribution of cargo received from the Antarctic stations. This responsibility includes assisting with the return of solid waste from Antarctica by identifying a suitable reception point in the US (currently Gray Harbor, Washington), negotiating terminal and stevedoring rates, and coordinating other assistance as needed.

C7.2.5.8 Reference

Section J, Attachment J-__ provides hours of operation for Port Hueneme, workload data for the summer and winter seasons, a list of vehicles and equipment assigned to the Port Hueneme office, and regulations to be observed in the transportation of hazardous/dangerous goods.

C7.2.6 New Zealand Operations

Christchurch, the largest city on the south island of New Zealand, is the point of departure and return for continental Antarctica and the staging area for program personnel and aircraft. The nearby harbor at Lyttleton provides port facilities for USAP research and cargo ships. Under a lease agreement with the Christchurch Airport Authority, the USAP maintains a complete administrative office and logistics support center at the International Antarctic Center (IAC) next to the airport as well as aviation support facilities and cargo staging areas on the airport grounds.

The most active period for the New Zealand office occurs between August and early March of each year. In mid-August, USAP participants begin transiting New Zealand for the Winfly deployment. There is a steady increase through the month of October, the heaviest deployment period, followed by a more even but no less sustained flow of passengers through late January. In February, the transient population increases sharply as most program participants return from McMurdo at the end of the summer season.

The pace of activity during this period is governed by flight operations. Scheduled flights to and from Antarctica are often delayed or canceled because of weather conditions, aircraft maintenance or other problems. This causes unpredictable backlogs in passenger and cargo movement, and affects programs in Antarctica. Therefore, the New Zealand office has to make daily and often hourly adjustments to schedules while continuing to manage the movement of transients to, from and within New Zealand.

Another challenge is the popularity of New Zealand as a travel destination. The USAP operating season parallels the summer tourist season; therefore, airline bookings and motel reservations must be made as far in advance as possible yet often rebooked according to changes in USAP flight schedules.

The contractor is responsible for New Zealand support operations. These responsibilities are described below.

C7.2.6.1 Transient Personnel Processing

Every year, the Christchurch office processes over ____ arriving/departing program participants, more than __ percent of whom transit New Zealand during the summer. The average length of stay in New Zealand per person each way is _ days, or _ days overall.

Processing includes meeting arriving passengers at the airport, arranging for motel accommodations in Christchurch, scheduling and providing extreme cold weather (ECW) clothing issue, coordinating any special requirements such as delicate or hazardous cargo, excess baggage, etc.; and tracking movement to/from New Zealand through the personnel tracking system (PTS), a computer-based program which locates and tracks USAP participants throughout their deployment.

C7.2.6.2 Cargo Processing

Christchurch processes several categories of cargo bound for continental Antarctica: Kilo-Air (vessel cargo that arrives in Lyttleton monthly via commercial vessel and is staged for air shipment to McMurdo in the USAP air

cargo yard at the airport), Air (air freight arriving in New Zealand via commercial or military air carrier and also staged for shipment in the air cargo yard), and locally procured cargo (parts, supplies and food purchased by the Christchurch office for air or vessel shipment to McMurdo). Duties include reception, inspection, reconciliation, and repackaging and documentation as needed. Christchurch also manages some types of retrograde cargo returned from Antarctica (“repair and return” items, science samples, etc.), and the shipment of special containers or hazardous cargo (dewars, etc.). Cargo operations are conducted at both the IAC and the airport and, depending on flight schedules, can take place 24 hours a day, 7 days a week.

C7.2.6.3 Coordination with Other Antarctic Programs and IAC Tenants

New Zealand’s Antarctic program (Antarctica New Zealand) and the Italian Antarctic Program also maintain offices at the IAC. By governmental agreement, the US and New Zealand Antarctic programs share some logistical support, and the contractor coordinates flight and cargo support for Antarctica New Zealand as required. Similarly, the contractor provides support for Russian, French and other foreign nationals transiting New Zealand under the auspices of their own national programs but with logistical assistance provided by the US according to *quid pro quo* agreements between NSF and the other programs.

Under the terms of an agreement with the New Zealand Defence Forces, the contractor is authorized “direct liaison” with the NZDF to coordinate several teams of NZ military personnel assigned cargo handling and passenger processing duties at the IAC and airport.

C7.2.6.4 Personnel Tracking System (PTS)

PTS is the computer-based personnel tracking system that links contractor headquarters with NSF, New Zealand, the Antarctic stations, Port Hueneme, and other USAP support organizations. PTS tracks personnel movement during deployment and provides the means to update and reconcile each participant’s location on an as required basis. The system is GFE. Operation, maintenance and, as appropriate, upgrade of the system will be a continuing contractor responsibility. See Section C.7.5 for additional information on the capabilities of PTS.

C7.2.6.5 Cargo Tracking System (CTS)

CTS is the computer-based cargo tracking system that links contractor headquarters with NSF, New Zealand, the Antarctic stations and Port Hueneme. CTS tracks cargo movement and provides the means to update and reconcile cargo operations on a daily basis. The system is GFE. Operation, maintenance and, as appropriate, upgrade of the system will be a continuing contractor responsibility.

C7.2.6.6 Air Operations

Christchurch closely coordinates summer flight operations to Antarctica with the Air National Guard (LC-130), US Air Force (C-141, C-5) and the Royal New Zealand Air Force (C-130). Each service maintains offices at the airport and the contractor’s staff coordinates preflight activities and maintains daily liaison with the NSF Representative, Air National Guard and the USAF during the summer season. Contractor duties include managing the IAC passenger terminal (scheduling passenger check-in and briefings, arranging for ground transportation and in-flight lunches); and ensuring that cargo is prepared for shipment, staged and forwarded as close to schedule as flying conditions allow. For return flights from Antarctica (or flights to Antarctica aborted while in the air), contractor staff meet arriving passengers and process their return.

C7.2.6.7 Port Operations

Christchurch coordinates support for the annual resupply vessel twice each year (January and February) at the Port of Lyttleton, arranges for surface shipment of other vessel cargo received throughout the year from Lyttleton to the airport where it is staged for air shipment to Antarctica, and coordinates ship husbanding services for the USAP icebreaking research vessels when in port (_ to _ times each year).

C7.2.6.8 Procurement and Contracts

The Christchurch office manages local procurement for the USAP. The contractor purchases fresh food for shipment to Antarctica, procures supplies and parts available in New Zealand or elsewhere in the Asia Pacific region for use in Antarctica or Christchurch, and secures local contractors to provide services needed by the USAP in New Zealand. Such services include clothing repair; facilities repair and renovation, food service, office equipment maintenance/repair, and travel agent assistance.

The contractor also administers legal representation for the USAP lease with the Airport Authority and manages a number of vehicle and equipment leases.

C7.2.6.9 Extreme Cold Weather (ECW) Clothing

Christchurch stores, issues, maintains and replaces the various items of clothing that constitute the ECW package issued to each Antarctic-bound participant, including military personnel. Clothing packages vary according to the length of stay and the duties of an individual, but, in general, consist of poly, fleece and windproof field garments as well as insulated work clothing suitable for the polar environment. The contractor maintains this inventory, prepares clothing issue for each participant based on his/her personal information form, cleans and repairs clothing when returned, and keeps stock at the correct levels. The clothing line is periodically evaluated and the contractor is expected to research the market, test new products and recommend improvements as appropriate.

C7.2.6.10 Post Office

The contractor operates the Armed Services Overseas US Post Office (APO) housed in the IAC. The Air Force has oversight responsibility the post office and the postmaster is a US Government employee, but most support tasks such as mail storage and mail distribution are performed by contractor employees.

C7.2.6.11 Other Support

The Christchurch office provides other support to the program as needed. The contractor staff supports the NSF Representative, New Zealand when assigned; assists NSF-sponsored visitor groups, provides short-term office space and computer availability for transiting personnel, and arranges special events such as conferences and receptions.

C7.2.6.12 Reference

Section J, Attachment J-___ shows the layout and function of USAP facilities at the IAC and airport, provides summer and winter hours of operation for the Christchurch office as well as workload data for the summer and winter seasons, and lists vehicles and equipment assigned to the Christchurch operation.

C7.2.7 South America Operations

The contractor maintains a bonded warehouse and clothing issue center in South America, currently at Punta Arenas, Chile. The _____ SF warehouse is leased from Punta Arenas Port Authority and is operated at present by AGUNSA, a contracted local agent. USAP participants deploying to Palmer Station or working onboard the research vessels are outfitted with a marine oriented ECW clothing issue at this facility. Cargo and mail for the station and ships is kept in bonded storage at the warehouse. The Agent also arranges for ship husbanding services in Chile, procures fresh food and locally available supplies, and arranges for other services as needed.

C7.3 Station and Ship Operations

C7.3.1 Overview

The USAP maintains three year-round stations in Antarctica and operates two icebreaking research vessels in the surrounding oceans. McMurdo Station was established in 1955, followed by Amundsen/Scott South Pole Station in 1957 and Palmer Station in 1965. Other year-round US stations have been constructed and operated in the past, but the three stations still in operation have proven the most important for scientific and geopolitical reasons. The icebreaking research vessels are the newest addition to the program, having been acquired in 1992 and 1997 respectively.

McMurdo is the main logistics center for the US continental program as well as the air support base for Amundsen/Scott South Pole Station and seasonal field camps. South Pole Station supports major astronomy and other science programs, and is located at the convergence of all national claims in Antarctica. Palmer Station sustains the US land presence in the Antarctic Peninsula region, while the research vessels provide the USAP with modern oceanographic research platforms as well as year-round access to Palmer.

The contractor operates and maintains the stations and research vessels. Primary services such as power and water, food service, housing, transportation, medical services, fire protection and waste management are ongoing requirements at each station, differing only in scope and location. Other services, such as construction/renovation work and science support tasks, depend on the annual program plan jointly developed by NSF and the contractor, and approved by NSF, each year.

The contractor also manages the day-to-day operation of the stations and their facilities. NSF's guidance is normally limited to inherently governmental duties such as regulatory oversight, allocation of USAP resources, and operational decisions concerning the various science projects; however, as a program-wide requirement the contractor shall recognize and support the following NSF policies in Antarctica.

Environmental protection of Antarctica is a continuing concern to USAP in the planning and conduct of its activities. The contractor shall comply with the spirit as well as the conditions of all applicable laws and procedures. (see Section C7.1.9)

The USAP implements oil spill prevention and control mechanisms at all stations and camps to ensure that the risk of accidental spills and leakage is minimized. The contractor shall follow Oil Pollution Act of 1990 guidelines and regulations with regard to fuels storage as well as spill contingency planning and response.

Safety and health are major concerns. All USAP operations on the continent shall follow accepted safety practices and, where applicable, incorporate safety methods designed for Antarctic field operations.

The risk of fire is a primary concern in Antarctica. The contractor shall provide 24-hour firefighting response at each of the three permanent stations at a level commensurate with the fire risks present. The operational philosophy shall be to protect human life and USAP property assets from loss or damage by fire through aggressive fire prevention and protection/suppression programs.

Medical care, sanitation, nutrition and workplace morale are factors that shall be addressed when developing operational plans and procedures.

Although more isolated and difficult to operate in than most locations, Antarctic job-sites employ many of the same maintenance, construction and administrative practices used in the domestic US. The contractor shall properly implement and, as requested by NSF recommend improvements to, existing PM/work order, estimating/scheduling, budgeting, capital improvement planning, and administrative recordkeeping programs. Limited populations at all US stations and camps is an express NSF goal. This goal shall be a primary consideration when developing contractor staffing plans and functional organizations as part of the annual program planning process.

C7.3.2 McMurdo Station

McMurdo Station, located at the tip of Hut Point Peninsula on Ross Island, is the largest US station in Antarctica. The summer season population can peak at over a 1100 people. The number of facilities at the station, the type and scope of activities, and the logistical support required to sustain operations are larger and more diverse than at

any other US station. Three airfields adjacent to the station support air operations to and from New Zealand as well as the annual airlift required to maintain Amundsen/Scott South Pole Station, and establish and support summer field camps and/or other remote activities during the summer operating season. McMurdo is also the world's southernmost inhabited location accessible by ship. Winter Quarters Bay at the foot of the station complex provides a deep water port for cargo and tanker vessels which can reach the station in late summer, after access channels have been cleared by icebreakers.

Operations at McMurdo span the two austral seasons. Summer (October - February) is the most active period, with an airlift maintained between New Zealand and McMurdo as well as McMurdo and South Pole Station, and ship operations from late December through late February. During the winter season (March - August), air and ship operations are suspended, the station population is reduced to a level of 125 to 150 people, and activities are restricted to the station complex and a few outlying facilities. The transition from winter to summer operations is known as the WINFLY (winter flyin) period. WINFLY begins in mid-August, when 3 flights are made to McMurdo carrying a 75 person workforce and additional science program participants to supplement the winter staff. This workforce reconstructs the various airfields and helps prepare the station for full operations in October, when the first of the summer ("mainbody") flights arrive.

C7.3.2.1 Station Management

During the austral summer, permanent NSF/OPP staff representatives monitor operations, safety and environmental policy; coordinate overall program support, and oversee science activities on a rotating basis during the summer season. A Station Manager employed by NSF represents NSF/OPP during the winter season.

The contractor provides management skills and resources sufficient to organize and direct the contractor workforce, and coordinate daily operations with NSF, other support organizations (Air National Guard, SPAWARS, NASA, US Coast Guard, helicopter contractor, etc.) and science groups. The generally rapid pace of activities, the changing weather conditions, and the constraints imposed by the austral seasons require the ability to work effectively while contending with a number of diverse, sometimes unexpected and often frustrating operational problems.

Management interaction during the austral summer includes various meetings between NSF the contractor and other support organizations - usually on a twice weekly basis - that plan air operations, review project status and resolve problems. The contractor also prepares a weekly operational report for NSF. Other meetings deal with specific agendas, such as individual science project requirements, airfield closures, ship off-load, personnel redeployment, etc.

During the austral winter, on-site contractor management interacts with the NSF Station Manager, and provides a written weekly report for satellite transmission to NSF and the contractor's domestic office.

C7.3.2.2 Communications and Meteorology

The contractor manages and staffs operational communications centers at McMurdo and the other stations. This function, based in Building 165 at McMurdo, includes a 24 hour/7 day radio communication watch (MAC OPS and MAC-Relay on HF, VHF and UHF circuits, including HF RTTY and, when visible, satellite links) maintained for air and ship operations, field party monitoring, conference calls and message traffic routing. McMurdo also serves as "net control" for USAP operations, and the contractor communications staff at McMurdo is responsible for enforcing accepted voice radio and message protocols program-wide. Some communications responsibilities are shared with NASA (see Section C7.5.4.1).

The communications center provides intercontinental and intracontinental flight following for all USAP aircraft during the flying season. This is a 24 hour/7 day responsibility and is conducted under applicable military and FAA regulations in conjunction with the SPAWARS air traffic control staff.

The contractor communications staff provides daily flight following and synoptic weather reporting. Observations and forecasts including operation and maintenance of recording equipment; launching and tracking of rawinsonde equipped balloons, and compilation and transmittal of weather data according to World Meteorological Organization standards is the responsibility of SPAWARS under a separate agreement with NSF.

Contractor staff maintain and operate the McMurdo telephone system, including the off-continent satellite link. See Section C7.5.4.1 for additional information.

Information on specific radio and telecommunications tasks and equipment is provided in Sections C7.5.4 through C7.5.7.

C7.3.2.3 Information Systems Infrastructure

Over the past 7-8 years, a modern information systems (IS) infrastructure has been established at McMurdo. Current system capabilities, projected improvements and contractor tasking are described in Section C.7.5.

At present, three primary PC-based IS programs are in program-wide use. Two of these programs help manage the movement of personnel and cargo while the third manages the preventive maintenance (PM) and corrective maintenance work for station facilities, utilities and vehicles. These programs are installed on the McMurdo LAN and each is GFE that will transfer to the next contract. Operation, maintenance and, as approved by NSF, improvement of these programs is a contractor responsibility. Summary descriptions are provided below; information on systems configuration, hardware and software is provided in Section C.7.5.

Personnel Tracking System (PTS) - PTS is the computer-based personnel tracking system that links McMurdo with contractor headquarters, NSF, New Zealand, the other Antarctic stations, Port Hueneme, and other USAP support organizations. PTS tracks personnel movement during deployment and provides the means to update and reconcile each participant's location on an as required basis. At McMurdo, it is used by the contractor to identify personnel status within the program (personal data, travel dates, special requirements, etc.), manage personnel movement to and from Antarctica, and provide berthing assignments at the stations. See Section C.7.5 for additional information on the capabilities of PTS.

Cargo Tracking System (CTS) - CTS is the computer-based cargo tracking system that links McMurdo with contractor headquarters, NSF, New Zealand, the other Antarctic stations and Port Hueneme. CTS tracks cargo movement and provides the means to update and reconcile cargo operations on a daily basis. At McMurdo, it is used primarily by the Movement Control Center. See Section C.7.5 for additional information on the capabilities of PTS.

MAPCON - MAPCON is the PC-based system that manages the preventive maintenance (PM) and work order/repair programs at the Antarctic stations. It records and tracks work order, PM and repair actions; maintains related parts and materials inventories, and reorders when thresholds are reached; and tracks budget and labor estimates against actual performance. MAPCON is used by the contractor's facilities, utilities and vehicle maintenance organizations although it can be extended to other functions. The MAPCON database is extensive, and any upgrades to the system must provide an interface to transfer the data intact. See Section C.7.5 for additional information on the components and capabilities of MAPCON.

C7.3.2.4 Station Primary Utilities

Electrical power for McMurdo Station is generated at Building 196, a ____ SF, two story facility built in 1981. The single story area is open-bay, housing 1 each 800 KW, 3 each 850 KW and 2 each 900 KW diesel/electric generators. A partition separates the switchgear and office area from the engine room. The second story contains additional office space and storage areas. The power plant is staffed and operated on a 24/7 basis year-round.

The average power load during the summer season is ____ KW with peaks up to 2 MW. Three units are normally on-line at one time and run through a 250 hour cycle. Winter loads average ____ KW. The power distribution system is overhead (power poles) or laid in cable trays networking the station buildings. Most cables, transformers and connections are between ____ and ____ years old.

A waste heat recovery system will be installed in the power plant during the 1998 winter, and will be fully operational by the time the new contract begins. The recovered heat will be used initially by the water plant, with heat routing to other buildings planned for the future.

The Water Plant, directly adjacent to the power plant (Building 198), processes salt water into fresh water in three 40,000 gallon-per-day (GPD), reverse osmosis (RO) desalinators. The building was constructed in 1981 and the RO desalinators were installed in 1994 to replace older flash evaporators. The plant includes fresh water holding tanks and pumping equipment. Water distribution throughout the station is via heat-taped, insulated pipes running along the utility network linking the various station buildings. The quality of all generated and stored water is tested every 12 hours. Water consumption at the station during the summer averages between 50-60,000 GPD; during the winter, consumption drops to _____ GPD. Like the power plant, the water plant is staffed and operated on a 24/7 basis year-round.

Graywater and blackwater from the station is discharged into the ocean through a network of heat-taped and insulated pipes. The outfall is located ____ feet offshore. At present, sewage is treated by maceration and dilution before leaving the outfall. The pollutants in the discharge stream are monitored as part of the station environmental program. Maintenance is limited to routine inspections of and, as needed, repairs to the system. Periodic underwater inspections are made by divers.

Specifications for the power plant and water plant, including consumption figures and recent maintenance histories, are provided in Section J, Attachment J- ____.

C7.3.2.5 Station Facilities and Ancillary Utilities

McMurdo Station has close to 100 buildings enclosing over 600,000 SF of heated and unheated space. These buildings range from Quonset Huts built in the late 1950s to the Crary Science and Engineering Center (CSEC; see Section C.7.4.3), completed in 1995. Most buildings date from the 1960s and 1970s, and are pre-engineered, metal structures of the “Robertson” or “Butler” design. A few buildings, such as the “Chalet”, NSF’s administrative office, are custom wooden designs.

Buildings are heated by forced air, oil fired furnaces, and plumbed and wired according to the purpose each building serves. Large berthing areas, such as the 200 series dormitories, have considerable plumbing and relatively sophisticated HVAC systems while many workspaces have only the basic features needed to support shop production.

Most buildings are kept in service, i.e., open with utilities in operation, year-round; however, McMurdo’s utilities systems are designed for winterization and, at the direction of NSF, the contractor closes/reopens buildings when cost-effective to do so.

Despite the number of different buildings, McMurdo is a small complex. Almost every structure within the “town” is in easy walking distance, and people move between living and working areas with little effort.

The contractor shall maintain, operate and repair facilities and related utilities on a year-round basis. This is level-of-effort work budgeted as part of the contractor’s baseline staffing plan. Renovation, demolition and/or new construction of facilities is planned and budgeted as part of the annual program plan (see Section C.7.6) as well as the long-range development plan now under review at NSF. Primary level-of-effort tasks are listed below.

Manage the MAPCON system as applied to facilities maintenance. MAPCON tasks include regular inspections of outdoor/indoors utilities, scheduled PMs, corrective actions, etc. (see Section C7.3.2.3).

Regularly inspect all facilities and structures to ensure that they are intact, safe and suitable for the purposes for which they are being used.

Maintain the buildings and utilities 24 hours day/7 days week, year-round according to the standards listed in Section F. Respond to any utility/facility discrepancy as follows: Emergency: 30 minute response to control the problem with a permanent repair within 24 hours; Priority: 24 hour response with a permanent repair within 7 days; Routine: 48 hour response with a permanent repair within 14 days.

Provide day-to-day monitoring and undertake all required repairs and upgrades to plumbing, piping and power distribution systems.

Perform PM and repairs on all interior utilities such as electrical services, plumbing, alarm systems, refrigeration and HVAC systems, motor controls, office equipment, science equipment and instrumentation, galley equipment, laundry equipment, etc.

Provide continuous operation of a service desk (24 hours/7 days) to receive and dispatch emergency and routine service calls (see Section C7.3.2.14).

Monitor and maintain emergency lights in all buildings.

Maintain and repair all overhead doors.

Make minor modifications and renovations to correct any deficiencies in existing facilities.

There are two primary facilities and utilities work centers at McMurdo. Building 136 houses shop and inventory storage space for metalworking, plumbing and electrical trades. Each trade shop is equipped with standard tooling as well as sufficient floor and bench space for the type of fabrication/repair work required to maintain McMurdo's facilities and utilities components.

Building 191 (actually two connected buildings) houses a carpentry work center. This building has the larger floor space needed for small to medium sized construction projects and is equipped with the standard shop tools of the trade. Several smaller buildings near Building 191 are used for painting projects and material storage.

Specifications for the principal buildings at McMurdo, including work order and service call histories for 1997, are provided in Section J, Attachment J- __ .

C7.3.2.6 Warehousing and Supply

The contractor controls _____ SF of enclosed warehouse space at McMurdo. Some of this space is in buildings reserved for warehousing with the rest incorporated into work centers. Contractor managed warehouses are described below.

Building 120 - _____ SF of heated space for computer equipment and supplies
Building 121 - _____ SF of heated space for electronic supplies.
Building 132 - _____ SF of heated space for vehicle parts and supplies.
Building 136 - _____ SF of heated space for plumbing, HVAC and electrical supplies
Building 140 - _____ SF of heated space for office supplies and _____ .
Building 141 - _____ SF of heated space for fuels equipment and supplies.
Building 164 - _____ SF of freezer space for frozen food.
Building 174 - _____ SF of unheated space for flammable supplies.
Building 176 - _____ SF of unheated space for dry food storage.
Building 340 - _____ SF of unheated space for _____ .
Building 341 - _____ SF of unheated space for _____ .

Building 342 - _____ SF of unheated space for _____ .

Major work centers such as the vehicle maintenance facility and crafts shops as well as science support centers such as the BFC and CSEC (see Sections C.7.4.3 and C.7.4.5) maintain tool, consumables and parts inventories in store rooms within the work center. These inventories are controlled by work center employees at each location during regular shift hours. Retail items (store inventories, beer, liquor and soda) are kept in locked, heated storerooms within or adjacent to the point of sale and are accessed only by authorized staff.

As stated, large items and bulk containers are stored outside, often on platforms near the using work center. For example, some heavy vehicle parts are stored on pads near the vehicle maintenance center (Building 143) while lumber and other building supplies are stored around and across the road from the carpentry shop (Building 191). A dedicated storage pad for Milvans and sea containers is also maintained.

C7.3.2.7 Vehicles and Equipment

Vehicles at McMurdo range from snowmobiles to large bulldozers. The inventory is divided into light, gasoline powered vehicles (snowmobiles, pickup trucks, small vans, lighter tracked personnel carriers); heavy, diesel powered vehicles and equipment (wheeled and tracked loaders, dozers and graders; snowblasts, cranes, fire engines, wheeled and tracked personnel carriers; and related equipment such as trailers, cargo sleds and tankers); and mobile support equipment (compressors, portable generators, portable heaters, welders, drills, and some aviation ground support equipment (GSE) such as APUs).

The average age of the vehicle and equipment inventory is ___ years, with most units being less than ___ years old but rarely newer than ____ . A few specialized polar machines (Caterpillar LGP D-8s) are 40 years old. A complete inventory, listing manufacturer and model number data, acquisition dates, and general operational condition, is provided in Section J as Attachment J- ____ .

Vehicle and equipment maintenance and repair is based at the Vehicle Maintenance Facility (VMF, Building 143), a 20,800 SF, two story structure erected in 1987. Nearly 10,000 SF of open bay space in the single story parts of the building accommodate all types of rolling stock. Movable, ceiling mounted cranes and floor based vehicles lifts provide heavy lifting capacity. The building also houses a machine shop (1600 SF), rebuild and fabrication areas (2420 SF), and over 6000 SF of controlled parts storage areas and office space. Service calls around town and to outlying areas are conducted with ___ wrecker and/or service trucks equipped with welding, lubrication and general repair capabilities. An inventory of shop tooling and equipment is provided in Section J, Attachment J- ____ .

The maintenance facility is staffed year-round on a 6 day work week. Current hours of operations are 0730-1730 and 1830 to 0530 during the summer season, and 0730-1730 during the winter season. Double shifts during the summer season are required to keep pace with 24 hour station operations including cargo and passenger movement, airfield support and access road maintenance. In general, the contractor is expected to provide all levels of PM, repair and overhaul, although the emphasis shall be on PM and scheduled overhauls rather than “ongoing” repairs sufficient to keep vehicles in operation. VMF personnel also provide operator-level maintenance instructions to USAP participants licensed to operate vehicles.

As much as possible, the VMF operates as a customer service center. A maintenance management department which includes a service writer and computer-based work order controls is staffed during each shift. These functions are integrated through the MAPCON program (see Sections C.7.3.2.3 and C.7.5).

The VMF also prepares vehicles for storage during winter, reactivates them for the summer and, when cost-effective, returns vehicles to the US for overhaul and return to the station on the following year’s vessel.

Another responsibility is annual review of the condition of the vehicle fleet. This review includes recommendations for standardization/upgrade, suggestions for improved contract service, and long-range performance forecasts to be used for fleet-wide replacement decisions.

Like most activities in Antarctica, VMF workloads can be driven by weather conditions and unexpected problems. Storms and other operational delays affect productivity and create unpredictable backlogs while the limitations of the annual resupply cycle cannot guarantee ready parts availability for all breakdowns.

Vehicles operations at and around McMurdo range from snowmobile use to multi-purpose bulldozer operations. The heaviest, general use is found in the light vehicle fleet: pickup trucks are in nearly constant operation while wheeled vans provide 24 hour shuttle bus service between the station and the airfields. Heavy equipment is also in relatively constant operation: snowblasts, graders and dozers are often engaged 24 hours in such tasks as snow removal and road maintenance while heavy trucks and tractors move cargo, fuel and trash; load/unload aircraft, transport passengers and support McMurdo-based science programs.

Two remote sites, Marble Point and Black Island (see Section C.7.3.2.18), are supported by surface traverse. Tractor and sled trains travel established routes (80-90 miles round trip to each location) to deliver bulk supplies and fuel as required during the summer. Trips are made to Black Island during winter if the communications equipment at the site malfunctions.

As discussed in Section C.7.4.5, a dedicated mechanical equipment center (MEC, Building 58) serves McMurdo-based and field science programs. This facility is staffed with sufficient shop tools and inventory to maintain and repair a light vehicle fleet (tracked personnel carriers and snowmobiles) and support equipment (drills, sleds, trailers, heaters, etc.) reserved for use by the science groups.

Vehicles are operated only by licensed drivers/operators. Licensing for light vehicles requires possession of a valid US domestic drivers license and instruction in operator maintenance and Antarctic driving conditions. Operation of heavy equipment requires sufficient background to operate such equipment safely and competently. Operator skill requirements range from apprentice to journeyman according to the employee job classification, with supplemental training and field experience in snowfield and permafrost environments as required.

Procedures governing the use and care of vehicles and heavy equipment are well established. These procedures, including average workload data, are provided in Section J, Attachment J- _ .

C7.3.2.8 Fuel Storage and Operation

McMurdo Station stores nearly 8 million gallons of fuel for aviation and ground requirements. Aviation fuel (AN-8) and ground equipment fuel (JP-5) are stored in ____ to ____ gallon capacity steel tanks located around the station complex. Gasoline is stored in a ____ gallon tank. Fuel is delivered once each year, usually in mid-January, when a tanker arrives in Winter Quarters Bay. Fuel off-load from the tanker is an around-the-clock operation, normally requiring four days to complete.

The contractor is responsible for conducting fuel-related activities in a manner which is consistent with minimizing the risk of accidental spills and leakage, and for maintaining an effective spill response capability which includes appropriate spill response equipment and trained spill response teams. The contractor shall also maintain accurate and current Spill Prevention Control and Countermeasures (SPCC) Plans and Oil Spill Response Contingency Plans.

Near-term plans call for replacement of many of the steel tanks at McMurdo with newer, more environmentally safe designs. The new tanks have larger capacity and better containment features than the existing tanks, and will be located in an area (the "pass") where containment without environmental damage can be effected by constructing berms around each tank installation. Procurement and erection of these tanks will be in-progress at the start of the new contract

Fuel is distributed throughout the station complex via a black steel pipe network controlled through __ pumping stations. One pump station is located near the pier where fuel is off-loaded and transferred to the various tanks and the other is _____. Remote buildings such as the transmitter building and VLF lab on Arrival Heights are fueled by truck. A vehicle fueling station, dispensing gasoline and JP-5, is located across the road from Building

141. The fuel piping network is being upgraded to an all welded system. This upgrade should be finished by the time the new contract is awarded.

The fuel distribution system extends to Williams Field and the Annual Ice Runway during the summer season. Flexible fuel hose runs of up to ____ miles in length are placed on the sea ice and ice shelf and connected to the fuel tanks and pumps at the airfields. Fuel is also delivered in sled mounted tankers pulled by tractors to outlying locations (Marble Point, Black Island) during resupply traverses.

Fuels equipment includes a variety of mobile pumps, test equipment, tools, connectors, hoses and tanks. This equipment is housed in Building 141, the O&M center for the fuels department, and is controlled through the MAPCON program (see Sections C.7.3.2.3 and C.7.5). Equipment is serviced and repaired in this building which also includes office space for the workforce and controlled inventory space for spare parts and consumables.

The McMurdo fuels department provides support to South Pole Station and summer field camps. Support includes technical guidance concerning the O&M of fuel systems, repair/calibration of fuels equipment as requested; and travel to the sites to set-up, inspect, and test fuel systems when necessary.

Procedures governing the operation and maintenance of fuels systems and equipment are well established. Procedural information sufficient to understand system requirements as well as average workload data, is provided in Section J, Attachment J- _ .

C7.3.2.9 Terminal Operations

Terminal Operations at McMurdo Station manages cargo and passenger transportation. It is the continental branch of the program logistics function and the department most responsible for movement of material and people to, from and within continental Antarctica.

Terminal Operations is based at Building 140, the Movement Control Center (MCC) and central station supply operation for McMurdo Station. The building contains office space, a passenger reception and cargo staging areas, the McMurdo post office, and controlled inventory storage. Adjacent to the building is a large outside pad used as a staging location for cargo. The contractor is responsible for Terminal Operations and shall manage the activities described below.

The MCC processes all fixed-wing aircraft passengers traveling to and from McMurdo Station. This includes preparing manifests, conducting pre-flight check-ins, arranging transportation to and from the airfields, and coordinating aircraft boarding/deplaning with flight crews.

During the summer, the MCC publishes and updates air and sea operations schedules. Air operations schedules require close monitoring as they change several times each day. The MCC posts schedules and several daily updates in Building 155 and on the McMurdo TV station flight operation channel. Updates are coordinated with the operations center (MAC-OPs) in Building 165.

All cargo received at McMurdo, transhipped to other locations, or prepared for shipment at McMurdo, is processed through the MCC. This includes unloading/loading aircraft, transporting cargo to and from the station, controlling security at the staging areas, distributing cargo throughout the station, constructing aircraft pallet loads and filling marine transportation vans, certifying hazardous and dangerous items for air shipment, documenting the contents of all cargo prepared for shipment; and tracking the movement of cargo to, from and within the continent. The MCC is also authorized "direct liaison" to coordinate the work of a Royal New Zealand Defence Forces detachment assigned to air cargo operations during the summer season as part of a US/NZ governmental agreement.

The MCC is the continental manager for the Cargo Tracking System (CTS), a computer-based cargo tracking system that links the Antarctic stations with contractor headquarters, the Port Hueneme, CA terminal and the Christchurch, NZ office. CTS tracks cargo movement and provides the means to update and reconcile cargo

operations on a daily basis. The system is GFE. Operation, maintenance and, as appropriate, upgrade of the system will be a continuing contractor responsibility.

The MCC operates the marine terminal (ice pier) next to Winter Quarters Bay. Tasks include staging of retrograde cargo, control of pier activities, and direction of cargo ship off-load and on-load operations at the pier followed by the staging of cargo to be transhipped the following season or distribution of cargo to the various McMurdo work centers. The MCC is also authorized “direct liaison” to coordinate the stevedoring work of a US Navy cargo handling detachment and the NZ Defence forces augmenting contractor personnel during the ship off-load/on-load evolution.

The McMurdo Post Office is housed in MCC and the contractor is designated and authorized to act as the local Postmaster by the US Air Force, which controls the APO serving the USAP. The contractor handles all incoming and outgoing US Mail as well as local mail (guard mail) between the stations and camps, sells stamps and postal insurance, and provides secure storage for mail.

During the summer, the MCC manages a scheduled shuttle bus service (passenger vans and all-terrain bus) between McMurdo and the airfields, and provides an on-call taxi and baggage handling service for residents/passengers with heavy baggage, etc., within the McMurdo complex.

The MCC is open 24 hours a day during the summer to facilitate around-the-clock flight operations and local transportation schedules. The post office and controlled inventory areas are open during posted business hours.

Section J, Attachment J -__ provides current hours of operation for the MCC, related supply operations, and the shuttle bus schedule; workload data for the summer and winter seasons, a list of vehicles and equipment assigned to the MCC, and regulations to be observed in mail handling as well as the transportation of hazardous/dangerous goods.

C7.3.2.10 Airfield and Aviation Support

One of the most time consuming and important tasks at McMurdo is construction, operation and maintenance of the three airfields that support the station, and are the base for intercontinental and intracontinental flight operations. The airfields, each with its own support and maintenance requirements, are described below.

Annual Ice Runway. This runway and related taxiways, parking lots and access roads are constructed on the annual sea ice of McMurdo Sound, normally within __ miles of the station. Depending on ice conditions, the runway may be situated in approximately the same location each year. Construction begins in August and the facility is ready for flight operations by 1 October. The primary runway (300' x 1000') and crosswind runway (220' x 8000) support landings and takeoffs by heavy, wheeled jets up to and including USAF C-5 transport aircraft. Ski/wheel landing gear aircraft (LC-130s) also operate from the ice runway to take advantage of the higher takeoff weights before shifting to Williams Field later in the season (see below).

Aircraft maintenance at the Ice Runway (and the other airfields) is limited to ground support and maintenance/repair tasks that can be performed outside as no hangers are available. Scheduled depot level maintenance is performed in New Zealand.

Construction tasks include ice measurement and survey before construction, siting the runway and parking areas, removing snow from the ice surface and leveling the ice as necessary, marker installation, berm construction, positioning flight-line and support buildings and utilities hook-up, fuel system placement and containment, and access road preparation. Maintenance includes keeping the airfield and roads clear of snow accumulation, moving facilities as needed and managing daily infrastructure support.

Support structures at the facility include mobile, ski mounted flight line and maintenance buildings, passenger terminals, power plants and other shelters. Aviation fuel is stored in sled mounted steel tanks and replenished by flexible fuel hose laid on the sea ice and connected to fuel storage and pumping systems at McMurdo.

The runway is in operation from early October until mid-December, by which time ice conditions deteriorate to the point that continued flight operations are impractical. Depending on flight schedules and weather conditions, the ice runway is in operation 24 hours per day.

Williams Field. This airfield is located on the Ross Ice Shelf, about ___ miles ESE of McMurdo. It is a snow runway (skiway) facility which supports ski equipped aircraft (LC-130, Twin Otter) operations. The main skiway (250' x 10000), crosswind skiway (200' x 8000') and parking are accessed by ___ miles of snow road from McMurdo.

Williams Field is a mobile complex. All buildings at the skiway, including dining and bath facilities, maintenance and flight line structures, and fuel tanks, are mounted on skids and can be moved as needed. Some of these facilities are relocated from the Ice Runway after it closes. Depending on annual ice conditions, a snow/ice road provides a link between Williams Field and the Ice Runway when both airfields are in operation.

Williams Field supports all ski-equipped flight operations and serves as a primary or alternate landing site for all ski-equipped aircraft. It cannot accommodate wheeled aircraft. Construction tasks include plowing, compacting and grooming the snow as necessary to create a level surface, marker and lighting installation, berm construction, building positioning and utilities hook-up, fuel system placement and containment, and access road construction (land/snow transition, compaction, leveling and, as required, elevation). Maintenance includes keeping the airfield and roads level and clear of snow drifting, moving facilities as needed and managing daily infrastructure support.

Williams Field also supports the Long Duration Balloon program, one of the atmospheric science projects. Launches take place near the airfield and equipment and personnel at Williams Field position the payload assembly building, prepare the launch sites and then support balloon inflation and launch operations.

Depending on flight schedules and weather conditions, Williams Field is in operation 24 hours per day.

Pegasus Field. This airfield is constructed on a permanent "blue ice" field about ___ miles ___ of McMurdo. It is normally placed in operation during WINFLY, closed when the Ice Runway opens, and then reopened from mid-January to the end of the summer season. The runway is 250' x 10000'. Being farther away, access to and support of this airfield is more difficult than the other two; however, Pegasus allows wheeled aircraft operations (USAF C-141) during the WINFLY evolution and at the end of the season (February and even into early March), which reduces the number of LC-130 flights required to return the summer population to New Zealand. Construction tasks include chipping, pulverizing and leveling the ice surface, protecting the surface from thermal decay (providing a snow cover), marker installation, fuel facilities support, building positioning and access road development. Maintenance requirements include the runway surface snow cover, infrastructure support and keeping the runway, staging areas and roads free of snow drifts.

Field Camp Skiways. As required, the contractor constructs and maintains skiways at field camps and remote AGO sites. Personnel with appropriate skiway experience are sent by the contractor to these locations as needed to establish prepared landing areas. Several specialized, lightweight snow grooming devices have been developed for this purpose. Field camp skiways are normally 250' x 10000'.

Ground Support Equipment. The contractor maintains, repairs and, as authorized, operates aircraft ground support equipment (GSE) in addition to that used by Terminal Operations for cargo/passenger operations. This equipment includes APUs, liquid oxygen carts, nitrogen carts, chemical toilet carts, hoists, scaffolding, etc., used for aircraft start-up and maintenance.

Section J, Attachment J- __ provides workload data for aviation support, including estimates of the number of hours, the types of tasks and the job skills required to construct and maintain the airfields and access roads, and the number and type of GSE maintained.

C7.3.2.11 Housing

The contractor is responsible for providing adequate housing/berthing at the US stations and camps for NSF staff, the contractor workforce, science groups, military units and other NSF-approved program participants or visitors. This is a program-wide requirement; however, because of the size of the population, the early season peaks and the number of transients throughout the austral summer, berthing at McMurdo is at a premium and housing management is a more complex task than at the other stations. The contractor's principal duties are described below:

Manage all berthing areas to include assignment of rooms, key control and enforcement of NSF-approved policies governing building use and housekeeping.

Regularly inspect berthing areas to ensure appropriate standards of habitability, safety and cleanliness are being maintained.

Direct a janitorial staff of sufficient size to clean offices, common use living spaces and bathrooms to the standards specified in Section F.

Provide change-of-occupancy room cleaning services as needed throughout the season.

Distribute incoming mail to NSF, contractor, military and science mail boxes.

Distribute and maintain television sets and video players as authorized for each berthing area.

Plan for replacements and upgrades to furnishings in housing facilities.

At the direction of NSF, arrange appropriate housing for the distinguished visitors that periodically visit the stations.

C7.3.2.12 Food Service

The contractor provides food service at all US Antarctic stations and camps. At McMurdo, the contractor staffs and manages a complete kitchen and cafeteria-style dining hall in Building 155. During the austral summer, the dining hall serves three full meals during normal work hours six days per week, a brunch and dinner on Sunday, and a midnight dinner meal for night shift workers seven days a week. The contractor also staffs a small kitchen and dining facility at Williams Field during the summer to feed the workforce maintaining the airfield and supporting flight operations.

The contractor's program-wide responsibilities include procurement of dry, frozen and fresh food; hiring of an appropriately skilled workforce, nutritional planning, food inventory control and rotation; and operation of food storage facilities, kitchens and dining halls in Antarctica.

Station food inventories are to be managed so that stock is rotated, variety and nutritional balance is maintained, and the reorder cycle keeps stocks at correct levels without significant shortages or overages.

Foodstuffs are to be of commercial quality, and obtained by agreements that take advantage of the purchasing power of the Federal Government and provide maximum value to the program. Except for limited shipments of fresh food purchased in New Zealand and shipped to McMurdo by air during the summer, food is transported to McMurdo entirely by vessel. The contractor must manage procurement so that vessel loading deadlines can be met each year.

Personnel shall have the skills to provide quality, institutional food service, and be employed in sufficient numbers to meet operating hour requirements at the stations and camps. Employment requirements range from one cook assignments at field camps to the multi-shift cafeteria staff at McMurdo.

The contractor is responsible for nutritional content and menu planning. Nutritional review by medical staff is required as part of the planning process. Sanitation of food service facilities is an important health concern, and the contractor must maintain cleanliness according to the standards listed in Section C.4.

Food often assumes significant importance at isolated job-sites, and dining halls are principal social settings. The contractor must understand the affect food has on morale and, within budgetary limitations, emphasize variety, tasteful preparation and dining hall ambiance as part of the food service function.

Section J, Attachment J-__ provides food service hours of operation for the stations, workload data for the summer and winter seasons, and nutritional and sanitation standards to be met under the contract.

C7.3.2.13 Waste Operations

The contractor shall comply with NSF regulation 45 CFR 671 in the conduct of all waste management activities. As described in Section C.7.1.9 the contractor shall apply for and obtain a permit which is issued by NSF. The permit application will include the submission of detailed plans and procedures for the management of all USAP waste to include waste operations at McMurdo Station.

Domestic and industrial nonhazardous waste is segregated by waste stream at the point of generation. At McMurdo, waste collection containers are located in dormitories, laboratories, workcenters and other central areas. Waste collection containers are also maintained at Williams Field, the Ice Runway and the Pegasus Runway during the periods when they are operational. Full waste containers are picked up and transported to the processing areas at McMurdo.

Hazardous wastes are collected in hazardous waste accumulation areas. Accumulation areas are generally co-located at or near the site of generation and their size varies depending on the volume and type of hazardous waste being generated. Hazardous wastes are transported from the accumulation area to a fenced, controlled access, hazardous waste yard. Final processing of the hazardous waste takes place within this yard.

A computer-based system for the accurate logging and tracking of the documentation needed to control waste management from the point of generation through point of final disposition in the US is maintained and operated by the contractor.

Most waste processing in Antarctica, both hazardous and nonhazardous, occurs at McMurdo Station. In addition to the McMurdo community and the outlying airfields, McMurdo is also the marshaling and processing center for wastes which are generated at other stations and on-board research vessels. These include: all hazardous and nonhazardous wastes from South Pole Station as well as remote field parties and camps; the hazardous and low level radioactive wastes generated on-board the research vessels which are off-loaded when these vessels call at McMurdo; and the hazardous and low level radioactive wastes from Palmer Station which are transported to McMurdo by research vessel when cruise schedules allow. Wastes from the distant stations, the remote locations and from the research vessels are integrated into the McMurdo waste streams and properly processed for removal by the annual resupply vessel.

Active processing of wastes at McMurdo essentially ends when the wastes are loaded onto the annual resupply vessel. No further characterization, segregation, packaging, documentation or other active waste management is performed once the waste is onboard the vessel. For that reason all wastes need to be classified, packaged, documented, and labeled before on-loading to the vessel according to the Resource Conservation and Recovery Act (RCRA), as well as applicable regulations issued by the US Department of Agriculture (USDA), State Departments

of Ecology and Health, Department of Transportation (DOT), International Air Traffic Association (IATA), and International Maritime Dangerous Goods Code (IMDG).

In addition to hands-on waste processing, the contractor must be proactive in the early identification of problems that may develop in the course of waste operations and recommend corrective measures. The contractor will routinely present general orientation briefings on the McMurdo Waste Management Program to USAP participants. Also, specialized small group training will be presented to those researchers who utilize radioisotopes in their investigations and thus generate controlled waste streams.

Section J, Attachment J-__ provides waste management workload data for the summer and winter seasons.

C7.3.2.14 Structural and Airfield Fire Services

The contractor provides fire prevention and firefighting services at McMurdo and its airfields. McMurdo is the only US Antarctic station with a full-time, 24 hour fire department. The other stations organize fire response teams within the workforce, with appropriate training provided before deployment. Contractor responsibilities at McMurdo Station include:

24 hour staffing and operation of the Firehouse (Building 182), including operation and maintenance of __ fire trucks and an ambulance.

Emergency spill response services.

Regular building inspections including preventive maintenance, repair and testing of all fire alarms, smoke/heat detectors and extinguishers.

Fire protection and firefighting training for contractor staff, science groups and other USAP participants as required.

24 hour operation of a response desk for medical emergencies, facilities/utilities/vehicle emergencies, and security problems.

Coordinating mass casualty and catastrophic damage response plans, and conducting drills and readiness training.

Providing the staffing and skills needed for a six minute response (engine on scene) to any fire alarm received within the McMurdo Station complex.

Responsibilities at the airfields include operation and maintenance of several “crash”-type fire vehicles, both wheeled and tracked, whenever flight operations are in progress and on “standby” status at all other times.

In developing fire protection capabilities for the USAP, the contractor shall utilize consensus standards, guidelines, and regulations that are appropriate. For example, staff training and experience for structural firefighters shall be consistent with National Fire Protection Association (NFPA) standards (e.g., 1001-1003); fire brigade members consistent with NFPA 600; and command, administrative, maintenance, and training personnel consistent with NFPA 1021, 1033, and 1041. Personnel providing airfield firefighting should meet NFPA 1003 requirements. Airfield crash/fire support to McMurdo Station airfields shall meet Department of Defense/Air Mobility Command Instruction 11-208, since DoD/AMC aircraft utilize the airfields and the contractor provides operational support. In providing these services, the Contractor shall utilize existing equipment and vehicles. If Fire Protection Services personnel also are involved in emergency response and hazardous materials spill mitigation, NFPA 472 shall be met. Occupational Safety and Health Administration (OSHA) standards pertaining to such activities (e.g., 29 CFR 1910.120; .156) shall be observed.

It is imperative that the firefighting response is rapid and effective, since the risks of fire, and their consequences, are significant. Initial fire protection response should be within three minutes from initial alarm to the site of a fire

within the station proper, with provision for back-up support in a timely manner. The fire protection services response in facilities can be tailored to the automatic fire detection/suppressions systems present in those facilities. For airfield crash/fire response, staging of fire-fighting assets should minimize response times, given the limitations of the equipment in that environment.

The contractor is responsible for developing an air disaster response plan for both fixed-wing aircraft and helicopters. The response plan is reviewed on a regular basis with NSF, the ANG and the helicopter contractor, and includes crash safety drills conducted at least once each season at all McMurdo airfields and helicopter landing sites.

Emergency response guidelines (not including, at present, Search and Rescue - see Section C.7.4.5) for the Antarctic stations are embodied in a plan that is undergoing review at NSF and may change before the next contract is awarded. The contractor will, however, retain a prominent role in the emergency response command structure.

Section J, Attachment J-__ provides a list of firefighting vehicles and equipment, workload data for the summer and winter seasons, and copies of the response procedures in current use at the station and airfields.

C7.3.2.15 Retail, Recreational and Religious Services

The contractor is responsible for community service functions at McMurdo. Similar services on a smaller scale are also provided by the contractor at the other stations. These functions are described below.

Clubs - The contractor operates and maintains three social centers (Buildings 76, 106 and 107) serving alcoholic and non-alcoholic beverages. Two of these facilities are bars (one allows smoking; the other is non-smoking) and the third is a coffeehouse that also serves wine. The clubs are revenue producing and no funds are appropriated for their operation - all inventory is paid for through sales and all profit is returned to an operating fund for improvements to the facilities or community activities approved by NSF. The contractor is responsible for managing the clubs; procuring, storing and restocking inventories; recruiting bartenders and other staff as needed (paid through the operating fund) from the population; and maintaining financial records according to NSF approved accounting practices.

Retail Store - The contractor operates and maintains a retail store in Building 155. The store sells toiletries, souvenirs, sundries such as film and batteries, and limited supplies of clothing and specialty food. Like the clubs, the store is revenue producing and no funds are appropriated for its operation: all inventory is paid for through sales and all profit is returned to a fund for other community equipment or activities approved by NSF. The contractor is responsible for managing the store; procuring, storing and restocking inventories; recruiting supplemental staff such as clerks (paid through the operating fund) from the population; and maintaining financial records according to NSF approved accounting practices.

Barber Services - The contractor provides haircutting services. A small shop, equipped with two chairs and standard barber supplies, is maintained in Building 155.

Library - The contractor maintains a ____ volume hardcover and paperback library in Building 155. The library is staffed on a volunteer basis.

Financial Services - The contractor provides a limited range of financial services, principally the management and operation of two Automated Teller Machines (ATM) leased through a commercial bank and installed in Building 155. The contractor arranges the lease, maintains the machines and ensures that they are stocked with sufficient cash to meet the demand (heaviest use before late summer season redeployment). The contractor can supplement the ATMs with other services such as check cashing and payroll advances according to its practices.

Television and Radio - The contractor manages a local television and radio service. Television includes a satellite link with the Armed Forces Radio and Television (AFRTS) network which features commercial programs transmitted via the Black Island communications site. The television station also broadcasts a local information channel which posts hours of operation for station services, provides a calendar of events, and regularly updates daily flight schedules. The contractor operates and maintains television equipment. Detailed information on the equipment and broadcast operations is provided in Section C.7.5.

The FM radio station is staffed and operated by volunteers, with scheduling as well as equipment maintenance and repair managed by the contractor.

Recreational Services - The contractor provides limited recreational services. These include two exercise rooms (an aerobic gym in Building 78 and a weight room in Building 63), a full-sized basketball court and other team sports gym (Building 75), a 2-lane bowling alley (Building 63), a recreational equipment inventory (also in Building 63: cross country skis and other sports items are available for individual check out and use according to NSF approved recreational policies) and, when possible, space for local theatrical or musical productions. The contractor also coordinates league play for team sports and organizes certain annual “events” such as the Scott’s Hut Race, holiday parties, etc.

Much of the recreational equipment is paid for through club and store profits, although recreational-related facilities improvements are included in the annual program plan as funding permits. Amenities such as televisions and video players for the dormitory lounges are considered to be part of the housing function, and are also budgeted when needed through the annual program plan.

The contractor is expected to manage the recreational program in a safe, responsible manner according to NSF policies. New recreational equipment, services or facilities improvements, whether procured with club/store profits or appropriated funds, are reviewed with NSF before acquisition.

Religious Services - The contractor operates the Chapel of the Snows (Building 7), McMurdo’s non-denominational house of worship, and staffs the chapel with an ordained minister during the summer. The minister arranges organized religious services, provides counseling and conducts various volunteer programs. Catholic Priests from New Zealand visit McMurdo on one month volunteer rotations during the summer to assist the contractor minister.

Attachment J-__ provides hours of operation for the various services, workload data for the summer and winter seasons, and procedures governing retail and for-profit operations under the USAP.

C7.3.2.16 Medical Services

At McMurdo, the clinic (Building 142), includes examination areas, a __ bed ward, controlled storage space, a small operating room, a dental office and administrative space. A diving decompression chamber installed in a room adjoining the clinic is also operated by the contractor (see Section C.7.4.5.6). An ambulance is housed in an attached garage. The ambulance is presently operated by fire department personnel with EMT certification. The contractor will staff and operate the clinic consistent with programmatic guidance contained in Section C.7.1.6.2.

The contractor shall maintain appropriate medical and dental supply inventories in the clinic, ensure the correct operation and calibration of all medical equipment, and provide recommendations for upgrade/replacement as technology improves.

The contractor medical staff establishes procedures for medical evacuations (medivacs) from field locations to McMurdo and from McMurdo to New Zealand, participates in the development of USAP emergency response plans, and coordinates mass casualty and similar exercises at McMurdo. Support is also provided to the physicians employed by the contractor at South Pole and Palmer Stations.

Section J, Attachment J-__ provides current hours of operation for the McMurdo clinic and a listing of installed equipment. A description of current clinic facilities and historical caseload summaries are provided in the Report of the USAP Medical Care Review Panel.

C7.3.2.17 Safety and Security

The contractor establishes procedures for the safety and security of government property as well as retail items and monetary assets. Procedures are also established for personal property security (dormitory key controls, for example) and the control of US Mail.

Crime is not a significant problem in Antarctica; however, incidents of vandalism, theft and physical assault have occurred at all of the stations. Such problems are often alcohol-related. The contractor shall establish policies for appropriate employee conduct, enforce them consistently, and provide whatever extra security is deemed appropriate for the bars, community events, etc.

The US Criminal Code extends to Antarctica and the NSF Station Manager at McMurdo has limited authority as a Federal Marshal.

C7.3.2.18 Remote Sites

The contractor operates and maintains several remote sites in the McMurdo Sound area that support operations at McMurdo Station as well as the summer science program. These sites are described below.

Marble Point Facility - Marble Point, on the continental coast of McMurdo Sound, is the location of a remote helicopter refueling station. It is roughly equidistant between McMurdo Station and the Dry Valley field camps. During the summer, the contractor staffs and operates a modular camp and a _____ gallon capacity fuel tank complex maintained at this location. The contractor staff provides 24 hour/7 day refueling for helicopters as well as meteorological readings and direct weather observations for SPAWARS at McMurdo. Each year (January?), the Marble Point fuel tanks are refilled from a US Coast Guard icebreaker. This operation is coordinated by the contractor staff at Marble Point.

The Marble Point camp is resupplied by surface traverse from McMurdo (when and how often?), also a contractor responsibility.

Black Island - Black Island, some 40 air miles from McMurdo Station, is a major communications transmission and receiving site for the USAP. The facility houses antennas, relay and telecommunications switching equipment, the majority of which is designed to operate without hands-on intervention under normal circumstances. The facility is staffed by the contractor during the summer season and accessed primarily by helicopter. During the winter, the site is unmanned. If repairs or other maintenance is required during the winter, the site is reached via surface traverse from McMurdo.

The contractor is responsible for operation and maintenance of the Black Island site, including camp living facilities and support structures, fuel tanks, wind generators, free standing antennas and the shells covering the large dish antennas. The contractor is also responsible for maintenance of the electronics and other communications equipment housed at the facility. Specific task examples are provided in Section C.7.5.

C7.3.3 South Pole Station

The United States has maintained a year round presence at the Geographic South Pole since 1957. The original station was constructed during the 1956-57 austral summer, modified and expanded over the years, and replaced in 1975 by the present geodesic dome and arch complex after a construction effort that began in 1970. During the last five years, several major astronomical observatories have been constructed within a half mile of the main

station complex. These and other observatories are also in year round operation, and are supported by the main station (see Section C.7.4.3)

The present station, limited by the original design and near the end of its useful life expectancy after 20 years of increasingly heavy use, is being upgraded to provide safe habitation until the phased transition to a replacement station begins during the 2001-2002 austral summer. Operation and upgrade of the present facility, ongoing support to the science program, and construction of the replacement station (see Section C.7.6.4) are all requirements under the ensuing contract.

South Pole Station is supported entirely by LC-130 airlift from McMurdo Station.

Operations at the South Pole are also divided into summer and winter seasons. The summer season begins on or about 1 November and ends in mid-February. This period represents the effective flying season, i.e., temperatures are warm enough for routine aircraft operations. The station must be resupplied and refueled while the airlift is available, and any major outside construction or maintenance task must be completed or suspended before winter begins.

Winter extends from station closing until late October or early November, a period of about eight months. Because of the darkness and extreme cold, very little outdoors work is undertaken in winter. Except for radio and satellite communications, the station and its occupants are completely isolated from the rest of the world during this period.

Summer populations at the station have climbed over the last 10 years and now average 180 people. The winter population ranges from 28 to 40 people. Roughly 30 percent of the population during each season is science program participants; the remainder are mostly contractor employees. During summer, over 75 percent of the population is housed in an adjoining "summer camp" consisting of barracks-type "Jamesway" structures and modular sanitary facilities. During winter, residents live in the berthing areas inside the dome or in an elevated structure near one of the archways. This structure and an independent power plant and fuel supply also serve as the emergency station for the winter population.

The contractor is responsible for operation and maintenance of the entire station.

C7.3.3.1 Station Management

The contractor provides sufficient resources to direct and control all O&M, science support and construction activities, summer and winter. This includes the annual program planning effort, workforce skill mix and allocation, administrative reporting; enforcement of safety, health and environmental policies; and consultation with NSF/OPP when needed. Most important, the contractor must provide the day-to-day management flexibility and informed understanding needed to adjust resources and schedules, recover from weather imposed delays; and accommodate a variety of minor and often frustrating operational problems related to the remote location, lack of outside support, aging infrastructure, and confined and overcrowded living conditions.

C7.3.3.2 Communications and Meteorology

The contractor staffs the station communications center 24 hours/7 days during the summer and ____ during the winter. The communications center maintains operational voice communications on HF, VHF and UHF circuits; and generates or relays message traffic on HF RTTY and, when visible, satellite links.

The South Pole communications center provides intracontinental flight following for all USAP aircraft during the flying season. This is a 24 hour/7 day responsibility and is conducted under McMurdo net control.

The contractor communications staff provides daily flight following and synoptic weather reporting. Data is generated by contractor employees who operate and maintain recording equipment, and launch and track rawinsonde equipped balloons twice daily. Weather data is compiled and transmitted to SPAWARS at McMurdo according to World Meteorological Organization standards year round.

C7.3.3.3 Information Systems Infrastructure

The contractor maintains, operates and repairs the following systems: HF and FM radio communications equipment; satellite voice, fax and modem links; and associated outside tower-mounted HF antennas and satellite dishes. The contractor also maintains a LAN PC system that incorporates the PTS, CTS and MAPCON work control programs (see Section C7.3.2.3). As at McMurdo, MAPCON is applied to PM and repair of station facilities, utilities and vehicles.

C7.3.3.4 Utilities and Facilities

The contractor operates, maintains and repairs the station power plant (3 each 450 KW diesel/electric generators and associated controls and switchgear), distribution systems (electrical, glycol heating, water, and sewage networks housed in a corrugated steel culvert tunnel “utilidor” beneath the station), and specialized utilities such as a snow water well providing the station drinking water, direct burial electrical power runs to outlying buildings, uninterruptible power supplies, etc.

Facilities maintenance includes HVAC and plumbing (building air handling and plumbing systems), interior remodels, and exterior repairs (building vestibules, doorways and landings; arch doors, staircases and walkways, etc.)

C7.3.3.5 Cargo, Warehousing and Supply

The contractor off-loads, receives and distributes incoming cargo at the station; prepares, documents, stages and on-loads all retrograde cargo; and manages the station inventories. Cargo reception and shipment is tracked through the CTS. During the summer, cargo operations are closely coordinated with McMurdo Station, and this requirement will intensify as the SPRP effort proceeds (see Section C.7.6.4).

Controlled and heated inventory space at South Pole Station is extremely limited. With the exception of some store items, beer, liquor and soda; electronic parts, medical supplies and science equipment, almost all other inventory is stored on unheated shelves inside the archways or on long berm lines outside of the station. Some progress is being made in adding the berm inventory to a computerized inventory listing; however, until the new station with its designed storage space is completed, inventory control at South Pole will remain a labor intensive effort.

C7.3.3.6 Vehicles and Equipment

The contractor maintains, repairs and operates a fleet of tracked vehicles (bulldozers, loaders and personnel carriers), several wheeled vehicles (shuttle bus vans and pickup trucks) and mobile support equipment (cranes, heaters, sleds, snowplanes, pumps, etc.). The maintenance and repair effort is controlled through MAPCON.

Vehicle and equipment operations at the South Pole include snow removal and grooming, skiway preparation and maintenance, berm construction, cargo movement, waste management support, aircraft cargo operations, personnel transport (including a shuttle bus-type service), building refueling, construction support and varied assistance to the science programs.

Flight operations and, more recently, construction and maintenance programs are in progress 24 hours a day. Therefore, vehicles and equipment are in relatively constant use, are central to the success of daily operations, and the contractor must provide the resources to keep the fleet in good condition.

C7.3.3.7 Fuel Operations

The contractor receives, maintains and controls station fuel inventories. Fuel is off-loaded from LC-130 aircraft wing tanks, transferred to the storage tanks in the fuel arch, and distributed to the power plant and garage arch

fueling station. Fuel is transported to the summer camp and outside work areas by tractor and sled. The contractor also maintains and repair fuels equipment.

The contractor is responsible for conducting fuel-related activities in a manner which is consistent with minimizing the risk of accidental spills and leakage, and for maintaining an effective spill response capability which includes appropriate spill response equipment and trained spill response teams. The contractor shall also maintain accurate and current Spill Prevention Control and Countermeasures (SPCC) Plans and Oil Spill Response Contingency Plans.

C7.3.3.8 Aviation Support

The contractor prepares and maintains a 250' x 14000' skiway and adjacent taxiways (including perimeter and distance markers and an "in use" warning light system for station residents), maintains and operates an aircraft fueling facility next to the taxiway, and provides support for a TACAN navigational unit maintained by SPAWARS. Ground support is typically provided to individual LC-130 aircraft landing and departing within the span of an hour (although 2-3 aircraft can be at the station simultaneously); however, Twin Otter and other aircraft sometimes remain overnight.

C7.3.3.9 Housing

The contractor manages housing (arriving/departing occupant berthing assignments, etc.), and provides janitorial (common area cleaning requirements and schedules) and laundry (bedsheets and other general laundry requirements) service. Berthing at the station during the summer is very crowded and requirements change daily with the arrival and departure of occupants.

C7.3.3.10 Food Service

The contractor prepares nutritious, balanced menus suitable for the high altitude polar plateau environment. Daily, scheduled food service (breakfast, lunch, and dinner six days per week; with a brunch and dinner served on Sunday) is provided year round. During the summer, a midnight dinner meal is also served six day per week for night shift operations. The contractor maintains and operates the kitchen, storage and dining areas; rotates food stock, and reorders food as needed to maintain sufficient inventory levels for a summer population of around 180 people and a winter population of 30-50.

C7.3.3.11 Waste Operations

The contractor shall comply with NSF regulation 45 CFR 671 in the conduct of all waste management activities at South Pole Station. As described in Sections C.7.1.9 and C.7.3.2.13, the contractor shall apply for and obtain a permit which is issued by NSF. The permit application will include the submission of detailed plans and procedures for the management of waste operations at the South Pole.

As at McMurdo, domestic and industrial nonhazardous waste is segregated by waste stream at the point of generation. Waste collection containers are located in workcenters, at collection points within the dome and archways, and at outlying research and living facilities.

The integrity of the USAP recycling program is maintained at South Pole Station, although processing of the various waste streams is directed toward air transportation to McMurdo Station. At McMurdo, South Pole-generated waste is integrated into the McMurdo waste streams and final processing is completed as discussed in Section C.7.3.2.13.

Hazardous wastes generated at South Pole Station are collected in hazardous waste accumulation centers. As with the nonhazardous waste streams, hazardous waste is processed for air transportation to McMurdo Station and integrated into the McMurdo waste streams as discussed in Section C.7.3.2.13.

C7.3.3.12 Fire and Safety

The contractor trains and organizes fire response teams. These teams are drawn from the workforce, principally the winter O&M staff, before deployment and receive formal training (normally a week long course) at a fire academy in the US. As needed, additional fire fighters are trained at the station to assist the core teams. Supplemental training and on-site fire safety inspections are provided by the McMurdo fire department. The contractor also maintains station fire alarm and smoke detection systems. Fire brigade members shall meet NFPA 600 and OSHA requirements (see Section C.4, 29 CFR 1910.156). Contractor personnel performing fire inspections or system checks shall meet appropriate credentialing consistent with NFPA.

Personal safety at the station (outside of industrial and workplace safety practices) is generally not a concern; however, as at McMurdo, the contractor shall establish and enforce policies for appropriate employee conduct.

C7.3.3.13 Medical Services

The contractor shall staff and operate the station clinic consistent with programmatic guidance contained in Section C.7.1.6.2. The contractor is responsible for maintaining medical equipment and supplies to keep inventories at appropriate levels.

C7.3.3.14 Retail and Recreational Services

The contractor maintains a small retail store and a bar at the station. The store and bar are revenue producing and no funds are appropriated for their operation. The contractor also manages limited recreation facilities. These include a small gym with a hardwood floor, a weight room, pool table and library within the main station; and a weight room at the summer camp. Some sports equipment such as skis is available for check-out. The contractor is responsible for ensuring that recreational activities are conducted in a safe and responsible fashion.

C7.3.3.15 Tourism

Over the last 10 years, non-governmental activity at the South Pole including commercial tourism has steadily increased. Outside groups visiting or transiting the Pole include skiers, tourists arriving via chartered aircraft, and even skydivers. USAP policies govern the station's interaction with private groups. Most visits are by now routine; however, accidents - such as the deaths of 3 skydivers during the 1997-98 season - can occur, and station resources must be diverted until any emergency situation is controlled.

C7.3.4 Palmer Station

Palmer Station, located on Anvers Island off the coast of the Antarctic Peninsula, is the United States' land-based research presence in peninsular Antarctica. The original station (since dismantled?) was built in 1965 and replaced by the present complex in 1968. Being furthest north, Palmer has the mildest and most marine climate of the US stations.

Unlike the other US stations, Palmer can be accessed year-round. It is supported entirely by ship (the two USAP icebreaking research vessels, USCG icebreakers (?) and, on occasion, other ships) from South America, which provides the means to rotate support staff and science personnel on a more frequent basis, and also eases the on-site inventory and compressed scheduling burden otherwise dictated by the austral seasons in Antarctica.

Palmer is the smallest US year-round station. The population averages 35 people during the summer, 20 during the winter, and the station cannot provide berthing for more than __ at any one time. Biological and atmospheric science programs are conducted at Palmer with a recent emphasis on ecological and UV monitoring projects. Observatories have been erected on several other islands near the main station for use by science parties and as emergency refuges.

The Antarctic Peninsula features more stations than any other part of Antarctica. Most Antarctic Treaty nations have at least one facility in the region and, because of the close proximity of various installations, national program resources are sometimes shared. The Peninsula is also a primary destination for the “adventure tourism” industry, and tour ships call at Palmer Station many times each year.

There is no plan to enlarge Palmer, although a facilities renovation program is scheduled to begin in ____ . The contractor is responsible for support, operation and maintenance of the entire station.

C7.3.4.1 Station Management

The contractor provides sufficient resources to direct and control all O&M, science support and construction activities, summer and winter. This includes the annual program planning effort, workforce skill mix and allocation, administrative reporting; enforcement of safety, health and environmental policies; and consultation with NSF/OPP when needed. Most important, the contractor provides the day-to-day management flexibility and informed understanding needed to adjust resources and schedules, recover from weather imposed delays; and accommodate a variety of minor and sometimes frustrating operational problems related to the remote location, lack of outside support, aging infrastructure, and confined and overcrowded living conditions.

C7.3.4.2 Communications and Meteorology

The contractor staffs the station communications center (what is the schedule?) during the summer and winter seasons. The communications center maintains operational voice communications on HF, VHF and UHF circuits; and generates or relays message traffic on HF RTTY and, when visible, satellite links. The communications center is the control point for local boating trips and other field parties, monitoring their location and advising of weather conditions.

The Palmer communications staff provides synoptic weather reporting as well as weather reports for ship traffic. The contractor operates and maintains recording equipment, and compiles and transmits weather data according to World Meteorological Organization standards year round.

C7.3.3.3 Information Systems Infrastructure

The contractor maintains, operates and repairs the following systems: HF and FM radio communications equipment; satellite voice, fax and modem links; and associated outside tower-mounted HF antennas and satellite dishes. The contractor also maintains a LAN PC system that incorporates the PTS, CTS and MAPCON work control programs (see Section C.7.3.2.3). As at McMurdo and South Pole, MAPCON is applied to PM and repair of station facilities, utilities and vehicles.

C7.3.4.4 Utilities and Facilities

The contractor operates, maintains and repairs the station power plant (2 each 250 KW diesel/electric generators and associated controls and switchgear, and a backup 120 KW unit), water desalinization plant (primary reverse osmosis unit with a capacity of 3000 GPD, and a backup RO units with a 1000 GPD capacity) and utilities distribution systems (electrical, glycol heating, water, and sewage networks). Power consumption at the station averages ____ KW with fresh water consumption of ____ GPD. Sewage is macerated and discharged into the bay.

There are two primary buildings at Palmer. “Biolab”, a 3-story, 8000 SF structure, houses the laboratory and attached aquarium (1st floor), kitchen, dining areas and office areas (2nd floor), and berthing (3rd floor). GWR, a 6000 SF structure, houses the garage and power plant, warehousing, additional berthing and recreation areas. Additional structures include the boathouse/dive locker, a crafts workshop, a seawater pumphouse, and several small science buildings and vaults

Facilities maintenance tasks typically include building air handling and plumbing systems, interior remodels and exterior repairs, and maintenance and repair of the dock and other support structures.

C7.3.4.5 Cargo, Warehousing and Supply

The contractor off-loads, receives and distributes cargo received by ship at the station (principally from the *Laurence M. Gould*); prepares, documents, stages and on-loads all retrograde cargo (also mostly transported by the *Gould*); and manages the station inventories. Cargo reception and shipment is tracked through the CTS.

Warehousing space at Palmer Station is also very limited. Most station support inventory is maintained in a 2000 SF area within GWR, with electronic parts, medical supplies and science inventories kept in heated storage in the associated work spaces. Bulk items such as lumber and bottled gasses are stockpiled outside, or in the Milvans kept on station.

C7.3.4.6 Vehicles and Equipment

The contractor maintains, repairs and operates several wheeled vehicles including two Skytrack boomed loaders, two Caterpillar wheeled loaders, a crane, 4 all terrain vehicles (ATV) and two snowmobiles. A fleet of 12 Zodiac inflatable boats powered by __ HP outboard motors are maintained in the Boathouse. The maintenance and repair effort is controlled through MAPCON.

Vehicle and equipment operations at Palmer include ship off-load/on-load and cargo movement around the station, waste management support, construction support and varied assistance to the science programs. With the exception of ATVs and snowmobiles, vehicles are confined to the immediate station vicinity. During the summer, the Zodiacs are in daily use and the contractor must ensure that they are safely maintained and suitably supplied for emergency conditions.

C7.3.4.7 Fuel Operations

The contractor receives, maintains and controls station fuel inventories. Palmer maintains supplies of Diesel Fuel Marine (DFM?), __ whatever fuel is used in the power plant (JP-5), and gasoline. Fuel is off-loaded from the ships via hose or in drums, transferred to the main storage tanks (__ steel tanks, each with _____ gallon capacity, and distributed as needed to the power plant and a vehicle fueling station. The contractor also maintains and repair fuels equipment.

The contractor is responsible for conducting fuel-related activities in a manner which is consistent with minimizing the risk of accidental spills and leakage, and for maintaining an effective spill response capability which includes appropriate spill response equipment and trained spill response teams. The contractor shall also maintain accurate and current Spill Prevention Control and Countermeasures (SPCC) Plans and Oil Spill Response Contingency Plans.

C7.3.4.8 Aviation Support

Palmer does not maintain a groomed landing site. However, small aircraft (Twin Otters and others) have landed on a nearby glacier, and ship-borne helicopters sometimes visit the station.

C7.3.4.9 Housing

The contractor manages housing (arriving/departing occupant berthing assignments, etc.), and provides janitorial (common area cleaning requirements and schedules) and laundry (bedsheets and other general laundry requirements) service. Berthing at the station during the summer is very crowded, and requirements change every couple of weeks with the arrival and departure of the ships.

C7.3.4.10 Food Service

The contractor provides daily, scheduled food service (breakfast, lunch, and dinner six days per week; with a brunch and dinner served on Sunday) year round. The contractor maintains and operates the kitchen, storage and dining areas; rotates food stock, and reorders food as needed to maintain sufficient inventory levels for a summer population of around 35 people and a winter population of 20.

C7.3.3.11 Waste Operations

The contractor shall comply with NSF regulation 45 CFR 671 in the conduct of all waste management activities at Palmer Station. As described in Sections C7.1.9 and C7.3.2.13, the contractor shall apply for and obtain a permit which is issued by NSF. The permit application will include the submission of detailed plans and procedures for the management of waste operations at Palmer.

As at McMurdo, domestic and industrial nonhazardous waste is segregated by waste stream at the point of generation. Waste collection containers are located in workcenters and at outside collection points.

The integrity of the USAP recycling program is maintained although processing of the various waste streams is directed toward vessel transport for disposal in Chile. As at McMurdo, the contractor is responsible for segregating, packaging, and staging nonhazardous waste before loading on-board designated vessels as scheduled by NSF.

Hazardous and low level radioactive wastes are separately processed from solid waste and are manifested for removal by vessel and disposal in the US. Active processing of wastes at Palmer ends when they are loaded onto a vessel destined for the US; therefore, waste documentation and packaging must be compliant with the same suite of US Federal and State regulations referenced in Section C7.3.2.13.

Subject to the USAP research vessel schedules approved by NSF in the annual program plan, Palmer-generated hazardous and radioactive wastes may be transported to McMurdo Station by research vessel for integration into the McMurdo waste streams prior to final processing.

C7.3.4.12 Fire and Safety

The contractor trains and organizes fire response teams according to the length of stay and duties of employees at the station. These teams are drawn from the O&M staff before deployment and each core team member receives formal training (normally a week long course) at a fire academy in the US. As needed, additional fire fighters are trained at the station to assist the core team. The contractor also maintains station fire alarm and smoke detection systems. Fire brigade members shall meet NFPA 600 and OSHA requirements (e.g., 29 CFR 1910.156). Personnel performing fire inspections or system checks shall meet appropriate credentialing consistent with NFPA.

Personal safety at the station (outside of marine, industrial and workplace safety practices) is generally not a concern; however, as at McMurdo and South Pole, the contractor shall establish and enforce policies for appropriate employee conduct.

C7.3.4.13 Medical Services

The contractor shall staff and operate the clinic consistent with programmatic guidance contained in Section C7.1.6.2. The contractor is responsible for maintaining medical equipment and supplies to keep inventories at appropriate levels.

C7.3.4.14 Retail and Recreational Services

The contractor maintains a small retail store and a bar at the station. The store and bar are revenue producing and no funds are appropriated for their operation. The contractor also manages limited recreation facilities. These

include a weight room, a pool table and a library. Some sports equipment such as skis (?) is available for check-out. The contractor is responsible for ensuring that recreational activities are conducted in a safe and responsible fashion.

C7.3.4.15 Tourism

Tourism has a more sustained and generally larger influence at Palmer than at the other stations. Under an agreement between the USAP and the (name of Antarctic tourist organization), tour groups can visit the station at certain times and according to certain “not-to-interfere” conditions. Sometimes an NSF Representative is on-site to manage these visits; at all other times the senior on-site contractor employee represents the program, and is expected to present the USAP in a professional and positive manner.

Tour ships operate safely and are generally a benign diversion; however, they are not officially supported by the USAP and the contractor must deal with them according to established USAP policy. Major accidents can occur: a tour vessel sank only ____ miles from the station in 1989.

C7.3.5 Research Vessels

C7.3.5.1 Marine Operations

The contractor manages the operations of two icebreaking research vessels. The vessels are under long-term (10 year) charter to the USAP. The newest vessel (acquired in December, 1997) is the R/V *Laurence M. Gould*, a 3400 ton research and cargo vessel. The second vessel (acquired in March, 1992) is the R/V *Nathaniel B. Palmer*, a 6800 ton research vessel.

Both vessels are rated as icebreakers, although only the *Gould* has the cargo carrying capacity to resupply Palmer Station, and both are owned and operated by Edison Chouest Offshore (ECO), a Louisiana-based company. The charters are Baltic Time Charters, written for the benefit of the USAP, and both are to be assumed and administered by the next contractor. ECO crews the vessels, and provides berthing and food for all passengers as part of the operating rate. The contractor pays directly for fuel and lubricants required to operate the vessels as well as for the material costs of the shipboard science programs.

ECO also manages ship husbandry tasks wherever the ships are based or make port. When developing the ship operating schedules as part of the annual program plan, the contractor and ECO include regular and mandatory shipyard periods that do not conflict with the science cruise schedule. All shipyard expenses (except any related to onboard scientific equipment owned by the government) are borne by ECO within the charters’ day-rates.

C7.3.5.2 Communications and Computing

The contractor is responsible for the computing functions aboard the research vessels, and works with the ships’ crews to provide off-ship communications. Each vessel is equipped with a Local Area Network (based upon hybrid UTP copper, 10BASE-2 coaxial, and fiber cabling) and a network server, which presently runs a Novell operating system providing networked file and print services, e-mail and office automation applications.

Workstations are standard personal computers as well as multiple networked Silicon Graphics (IRIX O/S) workstations. Real time data acquisition is supported, with interfaces to on-board marine electronics suites including sonar, sounders, temperature, salinity, GPS position, and ship’s navigation measurements and readings. Interfaces must also be supported to any grantee-supplied instrumentation. Automatic data logging is provided, which is script-driven and has mission-specific reconfiguration capabilities.

The vessels also have video capabilities as part of their computing-related functionality. The ship-board CATV systems use coaxial cable, modulators for connectivity to the data acquisition system (with scan converters), and interfaces with CCTV cameras to allow viewing of critical research mission and navigation data.

The *Gould* is equipped with an INMARSAT Standard-B ship earth station, including high speed data. This system is owned by NSF and maintained by the contractor. The ship is also equipped with an INMARSAT Standard-A analog system which is owned by the ship's owner/operator. Science computing is connected to the NSF-owned Standard-B system, which provides telephone and ISDN dial telephone service from the COMSAT Southbury Coastal Earth Station to networked computing services at the current contractor's headquarters. HF radio service is also available.

The *Palmer* is equipped in a similar fashion to the *Gould*. The current NSF-owned and operated INMARSAT system is a Mobile Telesystems Standard-A high speed ship earth terminal. This is planned for upgrade to Standard-B service. LAN connections are via a TCP/IP router and IP sessions are implemented via the 56k link with COMSAT's Santa Paula, CA earth station. The *Palmer* also has a INMARSAT Standard-C back-up unit for emergency communications.

C7.3.5.3 R/V NATHANIEL B. PALMER

The *Palmer* conducts science cruises in the oceans surrounding Antarctica throughout the year. The ship, staffed by an ECO crew of 21, is based at Punta Arenas, Chile, but depending on individual cruise objectives and routes, operates out of other locations such as Lyttleton, New Zealand, Hobart, Australia and Cape Town, South Africa . The ship has berthing for over 30 science program participants and sufficient laboratory space and computer systems to support ___ to ___ oceanographic and/or other projects during any one cruise. A normal cruise lasts four to six weeks.

The contractor provides the shipboard staffing required to support the science program planned for each cruise. On the *Palmer*, this typically consists of a contractor coordinator/manager responsible for overall science support as well as for representing the contractor when planning daily operations with the ship's Captain and the cruise chief scientist.

The contractor coordinator/manager supervises other shipboard contractor employees providing laboratory management (inventory control and work space allotment), IT/IS and other electronics-related services, and mechanical equipment (___ type ___) operation and maintenance. One employee is also qualified as an Emergency Medical Technician (EMT).

C7.3.5.4 R/V LAURENCE M. GOULD

Like the *Palmer*, the R/V *Gould* conducts science cruises in the oceans surrounding Antarctica throughout the year. Unlike the *Palmer*, *Gould* is designed to carry and load/unload container cargo so it can resupply Palmer Station and retrograde waste generated at the station. The ship, crewed by an ECO staff of 15, is also based at Punta Arenas. The *Gould* has berthing for 28 grantees and science support staff (including two, optional deck mounted berthing vans that can accommodate an additional 10 passengers during transits to Palmer), over 1600 SF of laboratory space, and a networked computer system.

C7.4 Science Support

C7.4.1 Introduction

C7.4.1.1 Overview

Almost every USAP activity can be considered a form of science support, as science is the principal expression and product of the US presence in Antarctica. This emphasis is reflected in OPP's mission statement, which, broadly stated, is to promote and support excellence in scientific research in and about the Antarctic region in accordance with national policies and the mission of the National Science Foundation.

As defined in this solicitation, "science support", means the direct provision of planning, logistical, operational and technical support to the science projects funded by the NSF in Antarctica. On average, the contractor supports

from 150 to 170 science projects, with a total field complement of between 600 and 700 participants, each year. The projects vary, but generally span marine science conducted from research vessels, land and sea ice based biology projects, a major astronomy effort at the South Pole, and glaciology, geophysics and geology field work at remote locations throughout Antarctica.

NSF dictates neither the content nor the course of science in Antarctica. Each year, NSF/OPP announces an open competition for proposals, and requests researchers to respond by predetermined deadlines (usually before 1 June of each year for funding and field work beginning at the earliest 12 months from the date of proposal submission) so that proposals can be reviewed for scientific merit and feasibility of support. The scientific evaluation is accomplished by an independent merit review process that does not involve the contractor. Proposals deemed suitable for funding within NSF funding and charter limits are considered suitable for award, and are further evaluated by OPP and the contractor to determine the scope and type of support required, both in Antarctica and the US. For proposals deemed worthy of funding, awards are made according to the total science funding available for the fiscal year. On average, one of every three proposals submitted is funded.

After award, successful researchers enter the formal USAP grant support process which, depending on individual requirements, provides direct and sustained assistance throughout the life of the grant. Management of the process at NSF direction, as described below, is one of the most important contractor responsibilities.

Section J, Attachment J- __ provides more information on the scientific program. A detailed description of the projects sponsored during the 1997-98 season can be found in the Science Program Summary

C7.4.1.2 Management and Technical Personnel Qualifications

The contractor shall employ individuals with the background and education required to both understand and support effectively a multi-disciplinary, multi-year science program. The manager of the science support function and other key staff must be familiar with academic research environments - including university laboratory management - and shall have the ability to support the type and scope of scientific research described in the Science Program Summary.

Although much of the support provided by the contractor to science groups is generic, there is an increasing emphasis on sophisticated analytical techniques and high technology instrumentation. Therefore, to provide effective support for more complex projects, the contractor will often need to acquire technical staff with skills equal to those required to support advanced research at major university laboratories .

C7.4.2 The Science Support Process

USAP science support is a year-round effort, and the contractor plays a key role at each stage of the process. The principal science support database and the stages of the grant support process are discussed below.

C7.4.2.1 USAP Information Database

Increasingly, NSF is relying on information technology/information services (IT/IS) to compile, maintain, update and generally improve the data bases needed to manage the science program. As part of NSF's open announcement for proposals, researchers unfamiliar with the USAP or polar science are made aware of an information data base established and maintained by the contractor on the World Wide Web: ESP (Electronic Support Planner). This web site is being developed by the incumbent contractor. When complete, ESP will allow prospective grantees to acquire relatively detailed knowledge of USAP resources before deciding to proceed with a formal proposal by:

accessing a complete USAP information data base (including inventories, facilities and equipment available in Antarctica);

providing a means for grantees to submit their operational support requirements to the contractor and NSF electronically, and;

enabling ongoing “real time” interaction between NSF, grantees, and the contractor during the pre-season planning process as well as during the field season.

The next contractor will assume responsibility for ESP.

C7.4.2.2 NSF and Contractor Proposal Review

At the same time as proposals submitted by the scientific community are going through the peer review discussed in Section C.7.4.1.1, NSF forwards copies of the proposals to the contractor for an initial operational review. The contractor is normally required to return a brief (1 page) evaluation of the probable support each proposal will require to NSF by the end of August. NSF refers to these evaluations when reviewing proposals that are deemed worthy of support after the merit review process, to determine if operational/logistical support is feasible before deciding to fund the proposals. Funding decisions are normally made between September and March of each year, and NSF notifies the contractor as projects are selected for award.

C7.4.2.3 Research Support Plan

The contractor is responsible for preparing a detailed logistical and operational support plan for each funded project by the end of May. The contractor fulfills this responsibility by expanding the initial evaluations into a Support Information Package (SIP) for each project. The SIP is a collection of documents describing the contractor’s support role and a set of forms requesting such information as: a synopsis of the group’s goals for the season with a focus on operational needs; procurement requirements; field equipment and field support needed; deployment and return dates; personal data of participants, etc. This information is used by the contractor to prepare a Research Support Plan (RSP) for each project.

After the SIP packages are received and the RSPs have been submitted to NSF for review, a series of meetings with the grantees is arranged by the contractor. At these meetings, NSF, contractor and grantee personnel discuss support plans and determine if all requirements have been included in the SIP. If not, those additional requirements which need to be addressed further before NSF approves a RSP are identified.

C7.4.2.4 Science Program Summary

After the meetings, the contractor incorporates any NSF-approved changes into individual RSP’s and publishes the “Science Program Summary” for the season. This is a bound, handbook size document containing summaries of each grant’s research objective and accompanying RSP (as part of ESP, this information will also be published electronically). This document is the final, approved science and support program for the upcoming season.

C7.4.2.5 User Group Meetings

The contractor also conducts User Group meetings, which are annual conferences arranged by the contractor for active grantees representing the “group” using facilities and services at a particular location, i.e., McMurdo, South Pole, Palmer or on-board the research vessels. User group meetings provide an opportunity for grantees, contractor personnel and NSF to review the previous season, discuss grantee concerns and interests, and identify problems for resolution. These sessions also provide grantees with an opportunity to discuss issues such as the direction of future research and the utilization of facilities, which enables the contractor and NSF to begin constructing a framework for projected support requirements.

C7.4.2.6 Procurement for Projects

The contractor procures, packages, documents, stages and transports materials and capital equipment identified for acquisition within individual RSPs. Because of the volume of purchasing conducted as well as the vendor data base maintained by the contractor, grantees can often obtain better prices and service by procuring through the contractor. Contractor responsibilities include determining specifications and delivery requirements with grantees,

arranging transportation and packaging (special containers, customs clearance, hazardous material documentation, etc.), and assisting with set-up/installation/ peripheral support of equipment at the stations.

C7.4.2.7 Field Season Activities

When the field season begins, science program participants deploy according to the approved plan. They are assisted in transit as required by contractor personnel and, upon arrival at their principal work location or staging area (for example, a party of geologists going to the Transantarctic mountains stages at and is supported by McMurdo Station), are provided with general station or vessel support (berthing, food, transportation, cargo movement, etc.), Antarctic “field” indoctrination as needed (snowcraft and survival schools, safety and environmental training, aviation and vehicle use procedures, etc.), and grant-specific assistance (laboratory management services including office space, computer access and assistance, instrumentation support, field equipment issue, sample retrieval and storage, etc.). At the end of their field season, grantees participate in an “outbrief” with NSF and contractor representatives to review the support provided by the program. Grantees are also asked to complete a written questionnaire evaluating the effectiveness of the contractor in providing the support authorized by NSF under the approved plan.

Contractor field and technical support responsibilities are described in detail in Sections C.7.4.4 and C.7.4.5.

C7.4.3 Antarctic Laboratories and Observatories

The contractor maintains, operates and provides scientific staff to support research at the laboratories and observatories at the US Antarctic stations and on-board the research vessels. These facilities and the contractor’s primary responsibilities are described below. A listing of the major capital equipment installed in each laboratory and observatory is provided in Section J, Attachment J- ____.

The contractor is responsible for management and oversight of all laboratories and observatories. This responsibility includes wiring (electrical and computing), plumbing, and permanent fixtures that are part of the research infrastructure. The contractor is required to obtain NSF approval before structural changes are made to any USAP facility (see Section C7.6), and must ensure that grantees understand that they are not to make such changes on their own.

C7.4.3.1 Crary Science and Engineering Center and Other McMurdo Sites

At McMurdo, the principal laboratory is the Crary Science and Engineering Center (CSEC). The CSEC was opened in 1995. It is a 46,500 SF structure with five work zone areas, designed to provide a flexible, working laboratory environment. A two-story core area is used for several purposes including IT support, office space and general staging areas; cold storage “environmental” rooms for ice cores, a library and a lecture hall. The laboratory space in the remaining areas was built with movable interior walls to allow each project to be given a work space that is appropriate to its needs. The laboratory space is used for a wide range of science activities in disciplines including biology, atmospheric sciences, and earth sciences. The CSEC houses wet and dry laboratories as well as an aquarium.

Although most heavily used by McMurdo based grantees, the CSEC supports research throughout Antarctica. Services such as analytical chemistry, cryogenics and instrument calibration are provided to South Pole, and the research vessels, as requested.

Almost all research activities in the CSEC are conducted during the austral summer. During the austral winter, activity in the CSEC is generally limited to inventory management and facilities maintenance and repair, although future years may include winter science programs.

The contractor manages and operates the CSEC. Contractor staff includes appropriate on-site management, technical support (IT/IS services, analytical chemistry, and instrumentation support with, as needed, specialized subcontractors or manufacturers’ representatives providing calibration/installation services), inventory control and

facilities maintenance positions. The CSEC is open and fully staffed by the contractor on a 10 hour/6 day schedule, with a skeleton crew on Sundays. Because the needs of the grantees for access to the laboratory and for support do not always coincide with normal working hours, the contractor must have CSEC staff on-call at all hours of the day.

Science is also conducted at a number of other sites in the McMurdo station area. These ancillary laboratory and science facilities include: Arrival Heights, RADARSAT, GPS stations, Gravibase station, and the UV monitoring site. The contractor's support responsibilities extend to these locations. Specific contractor duties vary by site.

C7.4.3.2 Amundsen/Scott South Pole Station Laboratories and Observatories

At South Pole Station, the contractor maintains instrumentation and facilities in the Skylab, a 4-story laboratory/observatory attached to the main station, and supports three large, elevated observatories one quarter to one half mile from the main station. Two observatories, the Center for Astrophysics Research in Antarctica (CARA) and AMANDA (Antarctic Muon and Neutrino Detector Array), are located in the "Dark Sector", across the skiway. A third elevated science facility, the Atmospheric Research Observatory (ARO), is located upwind of the station in the Clean Air Sector.

The South Pole observatories are staffed and managed by the contractor. Management responsibilities include the logistical (local transportation and cargo movement, power and fuel, and facilities maintenance and construction) support needed to operate the observatories year round. The primary observatory users are the science grantees. Grantees establish project support requirements, define the instrumentation needed, and specify the observational and data acquisition activities to conduct their research. As the ongoing manager of the facilities, the contractor must provide the continuity needed to meet changing project requirements, and facilitate the installation of new types of instrumentation in the laboratories and observatories and possibly at other remote sites.

C7.4.3.3 Palmer Station Laboratory

At Palmer Station, the contractor manages a 1900 SF laboratory, which primarily supports marine and terrestrial ecology and ecosystem research. There are indoor and outdoor aquarium facilities, as well as instrumentation located in several small buildings. Contractor staff provide on-site management, technical support (IT/IS services, instrumentation support), inventory control and facilities maintenance.

C7.4.3.4 Analytical Services

The contractor employs an Analytical Chemist and, as required, Analytic Technicians to provide program-wide analytical chemistry services. These employees are based at the McMurdo CSEC during the austral summer where they maintain analytical equipment and provide analytic services for individual grantees as defined in the RSP.

C7.4.4 Technical Support of the Science Program

C7.4.4.1 Scientific Information Services

The conduct of science within the USAP relies heavily upon the availability of computing and communications resources to collect and organize data, analyze it, and transport it to other locations for archiving and/or further analytic work. All of this work is done in the context of a research, academic environment, which is distinct from that required for operational and business computing systems. The requirements for projects vary substantially, and the contractor must be flexible enough to meet the full range of information needs. The primary source of information on the needs of the specific projects are their individual RSP's.

The contractor is required to work closely with grantees to plan for their computing and communications needs. The contractor will educate grantees on the standard computing and communications facilities and equipment that are available at Antarctic stations, and the types of connectivity that they support. The contractor will also be expected to supply grantees with hardware, software, specialized computing assistance - and hands-on installation,

calibration, maintenance and operation of systems and equipment - according to grant needs and budgets. Based upon their work with the grantees, and their own knowledge and investigation of current academic computing trends, the contractor is expected to report to NSF on perceived future requirements for changes in the information technology (IT) and information services (IS) infrastructure, and to develop cost-benefit analyses of viable options.

A detailed description of the currently installed IT infrastructure which is meant for science support is provided in Section C7.5. Generally, each grantee will have access to laboratory space and/or field equipment in Antarctica. Laboratory spaces are equipped with personal computers, with network access to printing and remote communications resources. All laboratory buildings are fully wired for telecommunications and networked computing. Research vessels are similarly wired, and have communications systems on-board which allow for access to remote sites for messaging and/or data transfer. Field parties are issued computing and communications equipment to supplement whatever they bring with them, in order to ensure that they have the facilities available to carry on their research.

The contractor shall provide sufficient staff to support implementation, maintenance, operations and training activities involved with all communications and computing that is done in support of science. Specifically, this includes the use of contractor staff to conduct on-going scientific work, data collection, data analysis and data transmission for year-round projects that continue experimentation after the grantees have left Antarctica. All such support is planned for and agreed to among the grantees, NSF and the contractor as part of the grant planning process.

C7.4.4.2 Science Technicians

The contractor has a limited direct role in research. Contractor Science Technicians operate, maintain and repair scientific data recording instrumentation at each of the stations. Most of these instruments support long-term science projects that are directed by investigators at academic institutions. The Science Technicians receive guidance from the investigators, interact with them as required throughout the year, and record/transmit data as required for each project.

At McMurdo, one contractor Science Technician is responsible for year round operation of a cosmic ray experiment housed in Building 84, VLF and other experiment instrumentation in the Arrival Heights Lab (Building 197) and, as assigned, other experiments.

At South Pole, two contractor Science Technicians are responsible for year round operation of a cosmic ray experiment, VLF instrumentation, seismometers, aurora all-sky cameras and other experiments housed in the Skylab as well as related instruments housed in undersnow vaults around the station. The Science Technicians also maintain the Automated Geophysical Observatory (AGO) located in the dark sector and provide “as required” support to experiments housed in the Atmospheric Research Observatory.

At Palmer Station, the contractor Science Technician is responsible for year round operation of VLF and UV instrumentation, seismometers, satellite imaging instrumentation and other experiments as directed. The technician also participates in the World Meteorology Organization (WMO) meteorological data collection effort.

C7.4.4.3 Cryogenics Support Services

The contractor procures, ships, stores and provides cryogenic materials (liquefied gases) for science activities at McMurdo, South Pole and onboard the research vessels. Currently, both liquid nitrogen and liquid helium are provided to the grantees by the contractor. Contractor personnel also operate liquid nitrogen plants at McMurdo and South Pole. An equipment list for the McMurdo and South Pole plants is provided in Section J, attachment J-
— .

Cryogenic operations within USAP are among the most sophisticated in the world. Because the program stores liquid gases for extended periods and must move substantial volumes of the gases between generation sites and

laboratories in Antarctica, the contractor must not only manage the current process effectively but must look for ways to improve operational efficiency

C7.4.4.4 Meteorology

Meteorology personnel employed by the contractor at South Pole operate and maintain weather tracking equipment and furnish weather data to the WMO. Although meteorological data is required primarily for operational reasons, it is made available to researchers as requested.

On a year round basis, contractor Meteorologists and Meteorology Technicians assigned to South Pole Station provide weather forecasting services, operate and maintain recording equipment, launch balloon-borne Rawinsondes twice each day, and provide synoptic and hourly aviation weather reports as required by SPAWARS (the air traffic control and weather office at McMurdo) for flight operations.

C7.4.4.5 UV Monitoring Network

The contractor manages subcontracted services for the maintenance and data distribution for NSF's Polar UV Monitoring Network, which is a distributed set of high-resolution UV scanning spectroradiometers. Network sites include McMurdo, South Pole and Palmer stations, Antarctica; Ushuaia, Argentina; and, Barrow, Alaska. Contractor Science Technicians operate the instrumentation at the Antarctic stations.

C7.4.4.6 Automated Geophysical Observatories (AGO)

The contractor operates and maintains the unmanned AGO network established at five remote sites on the continent and at South Pole Station. Responsibilities include installing and testing instrumentation before units are deployed, planning the field deployment of new units, and servicing (changing fuel supplies, repairing equipment and adding instrumentation) units already deployed. The contractor coordinates this work with the principal investigators whose experiments are housed in the AGOs.

AGOs are an efficient and effective means of conducting science in Antarctica; therefore, the network is likely to expand in the future. The contractor will support this expansion and will be expected to suggest ways to maximize the utility of the AGO network as part of the overall science planning process.

C7.4.5 Field Support Services

The contractor provides a comprehensive range of field support services for USAP grantees. These services include field gear outfitting, field safety planning and training, vehicle and equipment maintenance and repair, diving and dive tending, construction and fabrication, and direct and indirect aviation support.

Services vary in scope and duration according to the requirements of individual grants. During the course of a typical season, most grantees deploying to remote field sites are supported by McMurdo Station, which maintains a larger inventory of field equipment and provides a wider range of services than either South Pole or Palmer stations. Grantees at South Pole generally work at or near the station. Grantees at Palmer also work at or around the station, but routinely travel by boat to other locations. Some field parties deploy from the research vessels. On occasion, the USAP sponsors joint science programs with other nations which require field support from one or more of the US stations. At each station, it is the contractor's responsibility to ensure that grantees are properly equipped, trained and assisted according to the requirements of each RSP.

C7.4.5.1 Field Party Equipment Support

The contractor manages a field party outfitting and processing function. At McMurdo, this function includes a complete inventory of camping, mountaineering and sledging equipment maintained at the Berg Field Center (BFC, Building 160) along with an inventory of specialty food for field use stored next door (Building 73). Contractor employees manage the inventory, issue equipment and supplies to grantees, provide instruction as

needed, and clean and repair equipment when it is returned. The contractor reorders equipment/supplies as needed, periodically evaluates the effectiveness and adequacy of the inventory, and submits recommendations for improvement to NSF.

The field gear inventory at McMurdo has been developed to meet the conditions field parties encounter in Antarctica. Conditions range from dry cold and sustained wind on the interior of the continent to a wet, marine-like environment on the sea ice and at coastal locations. Each grantee is outfitted accordingly and receives training in equipment use as needed.

Field parties operating out of Palmer Station or from the research vessels are outfitted with field clothing at the Punta Arenas warehouse. Field equipment for parties working near Palmer Station is provided at the station, while field equipment for parties deploying to other areas of the Peninsula is generally provided on an as-needed basis through Punta Arenas. For field work at sites other than Palmer Station, food is ordered in advance as part of the RSP.

Employees of a subcontracted agent (presently AGUNSA) manage the Punta Arenas warehouse inventory, issue equipment and supplies to grantees, provide instruction as needed, and clean and repair equipment when it is returned. As at McMurdo, inventories at Palmer and Punta Arenas are periodically evaluated and recommendations for improvement are submitted to NSF.

C7.4.5.2 Mechanical Support

The contractor manages mechanical equipment and vehicle support for grantees. At McMurdo, a Mechanical Equipment Center (MEC, Building 58) is reserved specifically for the types of equipment and vehicles used by science parties. The contractor staffs this work center, maintains and repairs assigned equipment and vehicles, provides instruction in equipment/vehicle use to grantees, and orders parts and supplies as needed to keep inventories at correct levels. The effectiveness of the vehicle/equipment inventory is periodically evaluated and recommendations for replacement/upgrade are submitted to NSF.

Equipment maintained at the MEC includes rock drills, ice augers and melters; and portable heaters, welders and generators. Vehicles maintained at the MEC include several models of snowmobiles and several types of tracked personnel carriers. Over 100 vehicles are in the science support fleet.

Field parties operating out of Palmer Station or from the research vessels can draw some mechanical support equipment from the limited inventory at Palmer. In most cases, however, such equipment is shipped to Palmer, either from the warehouse inventory at Punta Arenas or as a shipment from the US prestaged at the warehouse in advance of the grantees arrival. Mechanical equipment provided at Palmer Station includes Zodiac boats and assorted equipment deployed from the boats. Contractor facilities employees at Palmer maintain and repair mechanical equipment used by grantees operating out of the station.

C7.4.5.3 Science Construction and Fabrication

The contractor provides construction services for science projects. At McMurdo and South Pole stations, support typically includes field design and construction of finished or unfinished portable buildings to be used as permanent field structures or temporary shelters; renovation of existing laboratory space, and miscellaneous construction ranging from containers for geological specimens (rock boxes) to tables, benches, etc., used at field camps. Construction services are arranged through the SIP planning process; modifications or additions thereto after deployment must be cleared through the NSF Representative. Similar services, although generally smaller in scale, are provided at Palmer Station.

For some projects, modular or prefabricated construction in the US followed by assembly on-site at the station is preferred. Such options are reviewed by the contractor, NSF and grantees during the planning process and, if selected, the contractor is then responsible for design, procurement, transport and assembly of components.

C7.4.5.4 Field Camp Support

The contractor plans, constructs, operates and manages seasonal field camps which support populations from 10 to over 100 people. These camps typically consist of portable “Jamesway” or similar structures providing workspace, berthing, dining and sanitary facilities built at snowfield locations on glaciers, the ice shelf or on the polar plateau. Sometimes, aircraft - usually Twin Otter fixed-wing airplanes or helicopters - are based at these camps to support the research teams. Several research camps in the Dry Valley area of McMurdo Sound and on islands near Palmer Station are built on ice-free land; therefore, facilities at these sites can be maintained indefinitely without the annual reconstruction/dismantlement often required for camps built on snow.

When included in the annual program plan, a large field camp is in operation for 2-3 months of each austral summer. Most are staged from McMurdo Station, although large, temporary camps have been built on the sea ice of the Antarctic Peninsula region. Contractor responsibilities include planning the camp with NSF and grantee user groups during the preseason, procuring any needed materials and equipment, staging construction materials for air transport to the site (about 2-3 weeks), building the camp (also 2-3 weeks), operating the camp (food service, mechanical and field support, waste management, administration, weather observation, etc.; usually, 5-8 weeks); and, if the camp will not operate in following seasons, dismantling structures and facilities and returning them to McMurdo.

Recent field camps include the Downstream B Camp, a glaciological research site in the active ice stream area of west Antarctica; Siple Dome, a 100-person camp supporting deep drilling and aerogeomagnetic research, also in west Antarctica; Shackleton Glacier, a helicopter supported research camp in the Transantarctic mountains; and the Long Term Ecological Research (LTER) project, several long-term research camps in the Dry Valleys and near Palmer Station. Both the Downstream B and the Siple Dome camp included contractor fixed-wing aircraft support.

During the next contract period, seasonal camps similar in size to Siple Dome will probably be built and operated in both west and east Antarctica. In addition, the USAP may conduct some extended surface traverses. These traverses may be multi-season events covering hundreds of miles and will require contractor procurement as well as operational support of research activity during the traverses.

C7.4.5.5 Field Training

The contractor provides field safety training for all USAP participants assigned to work at field locations. At McMurdo, field training consists of classroom instruction and video presentations usually followed by an overnight exercise at the outdoor “snowcraft survival” area located nearby on the Ross Ice Shelf. Other training includes aviation safety, environmental protection, first aid and fire safety conducted by both field training staff and functional departments at McMurdo. The contractor develops and/or modifies training programs to meet the needs of the annual program plan, and monitors their effectiveness. Contractor staff conducting this training must have appropriate field and polar/mountaineering-type skills as well as the ability to teach.

Field training is conducted at two levels. The first level is a mandatory, generic course in safety and outdoor skills for all USAP participants venturing into a field setting. The second level is a custom course which addresses the requirements of an RSP and builds on the first level of instruction. Typically, the custom course focuses on the terrain a particular group will encounter, provides supplemental/advanced training in important skills and/or certain equipment, and can include a practice deployment to set up and test equipment over a several day period.

On occasion, grantees may require direct support and/or guidance during their field deployment. In these cases, contractor field personnel with appropriate polar/mountaineering experience as well as the leadership ability to control field operations without interfering with research objectives, may accompany novice research parties into the field and establish a framework for safe and effective work.

The field training function at McMurdo is based at Building 138. Facilities include a classroom, equipment storage and office space.

Field training for South Pole Station personnel is conducted at McMurdo before departure or, if possible, field safety staff travel to South Pole to provide training on-site. Field training at Palmer is conducted at the station and includes sea ice and boating procedures appropriate for the location. Marine safety and lifeboat instruction are provided for all passengers on the research vessels as part of the subcontract charters.

C7.4.5.6 Diving Services

The contractor is responsible for the USAP Diving program, including research diving operations and tending near the stations or at remote sites in the general area of operations. The contractor operates and maintains the McMurdo Dive Locker (housed in the CSEC) and the Decompression Chamber, housed at the Medical Clinic (Building 142). A smaller dive locker is maintained by the contractor at Palmer Station. Diving is also conducted from the research vessels. The contractor is responsible for employing qualified divers with appropriate certifications, including those required to operate and maintain the decompression chamber. The contractor is also responsible for applicable insurance.

C7.4.5.7 Aviation Planning and Support

The contractor provides direct and indirect aviation support for the science program. Direct support is provided through a subcontract for Twin Otter aircraft, twin-engine airplanes designed for “bush” flying. These aircraft have the capability to transport small research parties to unprepared landing areas and can operate from remote fixed-bases, i.e., at field camps. Twin Otters can also be equipped with the airborne research instrumentation used by several ongoing grants. Two to three of these aircraft usually deploy each season and the contractor is responsible for soliciting, awarding and administering the subcontract; managing the aircraft workload during the season, and providing ground support to the aircraft at the stations and camps.

Indirect aviation support includes coordinating all science helicopter and fixed-wing flight operations. Under a prime contract with NSF, another contractor (currently Petroleum Helicopter Services, Inc. - PHI) operates and maintains a fleet of 4 helicopters at McMurdo Station. These aircraft support science projects in the McMurdo Sound region. When established, several helicopters may also operate from remote field camps. In late summer, helicopters from US Coast Guard icebreakers operate from McMurdo providing another aviation asset that, depending on availability, can be programmed into daily flight schedules. In future years, helicopters may also operate from the *Nathaniel B. Palmer*.

Helicopter operations at McMurdo are conducted 24 hours per day from October through February of each year. Because of the constantly changing weather and other operational factors, flight schedules must be updated on a daily and often hourly basis. During the summer, the contractor maintains a scheduling office in the helicopter hanger (Building 129) to coordinate daily flight activities.

The contractor is responsible for preparing the preliminary flight schedule as part of the research support plan, coordinating changes during the field season, and for ensuring that grantees are properly equipped and briefed before traveling on helicopters.

The contractor plans and coordinates grantee fixed-wing LC-130 aircraft support requirements. This includes preparing the preliminary flight schedule and grantee cargo load plans with the Air National Guard as part of the research support plan, ensuring that grantees are trained on LC-130 operations in the polar environment as part of their overall field training, and coordinating changes/updates to schedules and load plans during the field season. LC-130 flight operations are also subject to the vagaries of weather and, because of their age and more extensive maintenance requirements, these aircraft are more prone to mechanical delays than the helicopters.

During the summer, the contractor maintains an air planning office in the McMurdo operations center (Building 165) to coordinate daily LC-130 flight activities and provide grantees with operational assistance prior to, during and after their field deployment.

C7.4.5.8 Search and Rescue

The contractor plans and manages USAP's search and rescue capabilities. This function is coordinated by the field training staff, which also provides the mountaineering/crevasse rescue skills needed for effective response in remote field situations. A search and rescue plan which coordinates program aviation and medical assistance, and defines operational controls in emergencies, is developed by the contractor and approved by NSF. Search and rescue response depends on the location and nature of the emergency, but a common procedural plan, including appropriate drills/training and "mass casualty" contingencies, is required for all stations and camps. At Palmer Station, search and rescue planning includes provisions for marine SAR activities as well as rescues on land.

C7.4.6 Marine Science

C7.4.6.1 Marine Science Support Management

The contractor provides overall support for marine science. Operational support includes the management of two long-term marine charters, one for the R/V *Nathaniel B. Palmer*, a 6800 ton, 308-foot ABS Class A-2 icebreaking research vessel; and one for the R/V *Laurence M. Gould*, a 3400 ton, 230-foot ABS Class A-1 icebreaking research vessel. Both vessels are "floating laboratories", providing grantees with the facilities and equipment needed to conduct marine-based experimentation. Both vessels have the icebreaking capability to penetrate pack ice up to ___ feet thick, enabling year-round access to Palmer and the independent ability to reach McMurdo Station during the summer. Only the *Gould*, however, has the cargo carrying capacity to resupply Palmer Station.

The vessels are owned and operated by Edison Chouest Offshore, a Louisiana-based company. The charters are Baltic Time Charters, written for the benefit of the USAP, and both are to be assumed and administered by the next contractor. Edison Chouest crews the vessels, and provides berthing and food for all passengers. The contractor pays directly for fuel and lubricants required to operate the vessels as well as for the material costs of the shipboard science programs.

Contractor science support responsibilities encompass the preseason SIP/RSP planning associated with each grant including meetings and "user group" conferences, general laboratory supplies procurement and onboard inventory management, grant-specific equipment acquisition as well as onboard operation and maintenance as required, and shipboard staffing sufficient to support the science programs planned for each vessel cruise. Science support requirements vary according to the projects on-board during a cruise, but often include over-the-side sampling, diving and other activities that require contractor support.

C7.4.6.2 R/V *Nathaniel B. Palmer*

C7.4.6.2.1 Overall Support

The *Palmer* conducts science cruises in the oceans surrounding Antarctica throughout the year. The ship is based at Punta Arenas, Chile, but depending on individual cruise objectives and routes, operates out of other locations such as Lyttleton, New Zealand, Hobart, Australia and Cape Town, South Africa. The *Palmer* has berthing for 39 grantees and science support staff, over 5500 SF of laboratory space, and a fully networked computer system. Shipboard laboratories support biological oceanography, marine biology, chemical oceanography, physical oceanography, and marine geology and geophysics.

The contractor provides the shipboard staffing required to support the science program planned for each cruise. On the *Palmer*, this typically consists of a contractor coordinator/manager responsible for overall science support as well as for representing the contractor when dealing with the ship's Captain. The specific skills the contractor provides aboard the *Palmer* will vary from cruise to cruise, depending upon individual grantees and the types of science that they will conduct. The contractor must be able to acquire the skills needed for each cruise, sometimes on short notice. At least one contractor employee on every cruise is required to be qualified as an Emergency Medical Technician (EMT).

The contractor coordinator/manager supervises other shipboard contractor employees providing laboratory management (inventory control and work space allotment), instrumentation and equipment maintenance (installed sensors, benchtop equipment and over-the-side deployed equipment), IT/IS and other electronics-related services.

It is important that all equipment operate properly during a cruise, as the ability to obtain spare parts or to remove a piece of equipment for servicing is limited once the vessel has sailed. Therefore, the contractor is expected to have all of the proper equipment on hand, and completely checked out and calibrated prior to the actual cruise dates.

C7.4.6.2.2 Multibeam Operations

The contractor provides, operates and maintains the seabeam system mounted on the *Palmer*. This system uses echoing to produce ocean charts in real-time or near real-time. Multibeam operations are expensive - typically, three man-hours of effort are required to extract spurious data from each hour of system operation - however, the system provides invaluable support to many marine projects.

At present, the capability is subcontracted. The contractor administers the subcontract and provides logistical, transportation and shipboard support to the subcontractor.

C7.4.6.3 R/V *Laurence M. Gould*

Like the R/V *Palmer*, the *Gould* conducts science cruises in the oceans surrounding Antarctica throughout the year. Unlike the *Palmer*, *Gould* is designed to carry and load/unload container cargo so it can resupply Palmer Station and retrograde waste generated at the station. The ship is also based at Punta Arenas, Chile. The *Gould* has berthing for 28 grantees and science support staff, over 1600 SF of laboratory space, and a networked computer system.

The contractor provides the shipboard staffing required to support the science program planned for each cruise. On the *Gould*, this typically consists of a contractor coordinator/manager responsible for overall science support as well as for representing the contractor when dealing with the ship's Captain.

The contractor coordinator/manager supervises other shipboard contractor employees providing laboratory management (inventory control and work space allotment), IT/IS and other electronics-related services, and mechanical equipment (____ type ____) operation and maintenance. One employee is also qualified as an Emergency Medical Technician (EMT).

C7.4.7 Telecommunications Support

The contractor will have the responsibility for the procurement, design, installation, operation, maintenance and upgrade of Antarctic communication systems (exclusive of those systems used in aircraft operations). The telecommunications support functions as they relate to science support include ensuring that grantees are able to communicate effectively and efficiently with USAP personnel while they are in the field, and that they have access to communications with their home institutions and other researchers from Antarctica. This support will include voice and data transmission and reception via telephone or radio links. The contractor has the responsibility of scheduling transmissions according to the availability of links, which vary according to the station from or to which communications is required.

There are four general types of telecommunications that relate to science support activities, each with its own requirements and profiles. The four types of telecommunications are: science at permanent stations to and from global sites; field locations to and from global sites; Dry Valley locations to and from McMurdo station; and, deep field locations to and from McMurdo station. The contractor is responsible for the installation, operation and maintenance of all of these system, and will provide equipment and training, as required to grantees.

At permanent stations in Antarctica, grantees have access to computer work-stations in their laboratories, and at other locations around the stations. From these work-stations, which are typically desk-top personal computers, grantees can access printers, network servers, their e-mail accounts and the World Wide Web for Internet connections to off-ice locations, including their home institutions. Grantees can also utilize voice communications including, telephone and fax lines from the stations. Taken together, these facilities allow grantees to be in touch with their colleagues, and to send and receive messages and data. Access, especially to and from South Pole, is not always real-time, because it is dependent upon the ability to obtain access to satellites which are above the horizon only for discrete blocks of time on any given day.

Communications from field sites to global locations utilize access to satellites on a line-of-sight contact basis for long-distance communications. The INMARSAT standard-C earth terminal provides this connection for the Copa Cabana field camp on the Peninsula. Data transmission is currently available only at modest transfer rates, and is relayed out through satellite connections to destinations off of the continent. Radio communications can be patched to voice systems for connections overseas.

Field sites in the Dry Valleys have access to a variety of communications with McMurdo station. Currently available systems include: UHF radiotelephones; HF manpack radios; VHF land mobile base station and hand-held units; and, INMARSAT standard-C for POP3 e-mail service.

Remote field camps communicate with other Antarctic station sites through HF and VHF radio service, and at large camps, ATS-3 portable voice/data systems

Research vessels communicate with Antarctic sites and other locations through the use of INMARSAT Standard-B high speed data earth station connectivity.

C7.5 Information Technology and Communications Systems

C7.5.1 Overview

The contractor serves as the primary provider of Information Technology infrastructure, products, and services in support of the USAP mission. This responsibility includes enterprise-wide functions and services that are not confined to any one geographic location and which extend beyond the Antarctic operating area to other parts of the globe. The Contractor is the principal agent for the definition, development, implementation, operation, and decommissioning of the USAP information infrastructure. The infrastructure includes both communications and computing components, all of which are critical to the success of the USAP.

The contractor is responsible for any required Information Technology system design, operating procedures, procurement as required, installation, maintenance and upgrades, including hardware and software, and systems capability. The contractor must interface with and support both an internal and an external customer base. The internal customer base is the contractor's own organization and NSF/OPP. The external customer base consists of individual science grant holders, other US Government agency Antarctic-related mission activities in collaboration with NSF, and other US Government groups supporting USAP logistics and operations (such as the NYANG).

The USAP's information infrastructure consists of several major component types. Included are: interconnected and inter-operable telecommunications circuits and systems; radio communications systems; leased and public network common carrier services; computer networks; computer applications servers; end-user computing appliances; software applications; data; and, related technology (such as electronic SCADA control systems, video/CATV systems, satellite tracking/data acquisition systems, instrumentation, special power systems, etc.). The contractor must be able to provide innovative solutions to information and communications problems as they occur, while maintaining and upgrading this computing and telecommunications infrastructure.

The Contractor's primary Information Technology functions are:

Enterprise IT management and planning;

Technology management;

Research and systems engineering for development, testing, and evaluation purposes;

Information/business process applications development and implementation;

IT infrastructure deployment;

Technical operations;

Customer services, with an emphasis on IT support to USAP science activities;

Information dissemination.

The Contractor will provide cross-cutting IT support to enable or facilitate business processes or mission objectives for all USAP stakeholder and functional groups, including: science research grantees; Command/Control and management; station operations; management and administration; logistics and transportation; health, safety; morale, welfare, and recreation; and, information outreach.

The IT infrastructure, products, and services which are the responsibility of the Contractor fall into the following broad technical categories:

Telecommunications/radio communications

Data communications and networks

Computing systems

Database and other software systems/applications

General purpose and mission-unique electronic technology

C7.5.2 Management and Planning

C7.5.2.1 Enterprise IT Management and Planning

As part of the overall management and planning process, the contractor is responsible for the creation of detailed plans for communications and computing infrastructure and support activities. The contractor must plan for enterprise-wide IT goals as well as globally and locally-implemented tasks so that the most effective and efficient mix of services are available to the USAP, consistent with budgetary limitations. This balance between investment and functionality will require the contractor to maintain a detailed knowledge of both program IT requirements and IT industry advancements and “standards”.

The contractor is required to plan for the provision of the appropriate information technology infrastructure. This means that the contractor is required to conduct appropriate planning and management functions so as to achieve fully inter-connected, enterprise-wide systems. The USAP technical IT management planning functions will require the contractor to adequately address Technology Forecasting/Insertion and Planning tasks such as:

IT Mission needs assessments;

Strategic and long range planning ;

The development and maintenance of an IT technical architecture plan;

Technology reviews and recommendations;

IT project proposal development;

Customer interfaces for long range planning (i.e., with grantees or customers external to IT)

There is a currently defined requirement to develop the USAP IT Enterprise Strategic Plan early in the contract cycle. This plan is a necessary first step in the overall planning process and will allow for the later development of a credible USAP IT Enterprise Long-Range Implementation Plan. The implementation plan translates input from the Enterprise Strategic Plan and from a Life Cycle Management Assessment and Plan (also to be developed) into a specific plan for implementation that spans multiple years. Budgetary cost estimates would be included and updated. This effort will require the contractor to work with and obtain input from other USAP logistical support agencies, such as the USANG and the SPAWAR Systems Center. Annual updates for sustaining maintenance of the implementation plan is included in the requirement.

Taken together, these plans will ensure that the IT enterprise strategy adopted for USAP complies with GPRA requirements for linkages to program (USAP) and agency (NSF) strategic goals and objectives. The contractor must undertake this effort utilizing staff who possess practiced skills in strategic planning techniques and processes. Staff assigned to the work should have clear credentials in corporate-level strategic planning. Sustained maintenance of the enterprise strategic plan through tri-annual updates is also required.

Plans and tasks, other than those discussed above, will be assigned to the contractor by NSF, as appropriate.

C7.5.2.2 Technology Management

The contractor is required to management the IT process so as to provide the information technology infrastructure, and to deliver all necessary maintenance and services for that infrastructure. This means that the contractor is required to conduct and manage the IT functions so as to maintain a robust set of inter-connected, enterprise-wide systems. The USAP technical IT management functions will require the contractor to actively address the following issue areas:

Systems Engineering, which includes -

Requirements/needs assessment, customer interface definition, SIP review support

Project proposal development

Project management, planning, and implementation

Technical discipline subject matter and engineering expertise (the contractor will be required to demonstrate the availability of qualified staff with critical skill areas expertise, either in-house, or external to the full-time staff, but on-call)

Operational readiness reviews

Systems Life Cycle Management, which will involve -

Programmed periodic systems life cycle reviews and reports;

Systems sunset reviews, phase-outs;

Systems integrated logistics support planning that covers training, parts, vendor support, etc.;

Systems maintenance management plan development (with Technical Operations).

Sustaining Engineering, that will require the contractor to perform -

As-built and systems documentation maintenance;

Field Change Order, systems configuration control management;

Systems technical performance assessments and reports; analysis of tactical performance data;

Systems evolution (modification, partial replacement, etc.);

Field engineering support; on-site technical needs assessments

In-depth technical input to, and review of, the Operational Maintenance Management Plan;

Customer technical support to grantees, and all other internal or external IT customers).

Engineering Technical Support Services, which will encompass -

Electronic technology/systems CAD/drafting;

Technical writing/documentation;

Standards, references, technical data;

Electronic technology development and/or review, including bench-level instrumentation prototype breadboard construction, testing, evaluation, and integration;

Instrumentation and grantee equipment interface and readiness testing.

Additional technology management and planning activities are intended by NSF/OPP to be assigned to the contractor. Among the Special Studies and Reports under active consideration are the following:

USAP Enterprise-wide Business Process Re-engineering – This effort will assess the specific areas in the USAP business processes and work flow to which information technology should be applied. The goal of the exercise is to use applied structure and formalism to determine the priority areas in which to make an investment in IT applications, so as to maximize Return On Investment (ROI) for IT funding. ROI is to be measured in terms of business productivity benefits to USAP operations, not as IT technology or IT cost savings measures. The completion of this effort will bring the USAP into compliance with the Clinger-Cohen Act of 1996 (also known as the Information Technology Management Reform Act).

USAP Enterprise Information Architecture - this is a likely follow-on to the BPR study. The USAP needs to create a focused, strategically planned architecture for the use of information within the program. There is much discussion now about GPRA conformance, performance measurement, full cost accounting/charge-back, improvements in information dissemination to grantees/public, better grantee requirements planning, etc. All of these issues involve the collection, use, sharing, manipulation, and management of data, done by automated data processing systems with data base technology. The net ROI on needed improvements to the USAP business process is critically dependent upon the effective design of the implementing technology. A formal systems architecture design, as opposed to a quasi-random evolution from piecemeal applications is mandatory. This concept is also in keeping with the Clinger-Cohen Act of 1996.

USAP Information Security Plan - this is a necessary, Government directed, assessment which will bring NSF conduct of the USAP into conformance with OMB Circular A-130 Rev. 3 and the Clinger-Cohen Act of 1996. It must be approached from the perspective of the Government's requirements, and a USAP enterprise viewpoint.

This plan will ultimately provide guidance from NSF to all USAP contractor and supporting Government agencies regarding Information Security policy, procedures, and enforcement.

IT Systems Life Cycle Management Plan - this is a core strategic objective which is needed to gain control of the cost and operational disruptions caused by technology churn and the advancing age of current legacy systems. This type of planning is essential for developing and sustaining a credible, cost affordable Long Range Plan for IT. This will cross-cut on tactical performance measures and maintenance management. Annual or bi-annual updates for sustaining maintenance of the plan is included in the requirement.

USAP Management and Operational Information System Redesign - this is a special focus topic which will develop out of the Business Process Re-engineering, Information Architecture Planning and Life Cycle Management activities. It deals specifically with the critical state of the main USAP database management information systems: PTS, CTS, MAPCON, and Power 1000. These systems are at the end of their useful lifetimes due to obsolete technology in the underlying database language, the limitations in capability of the database language, and the functional needs/requirements of the supported business processes (i.e., logistics, operations, etc.) outstripping the capabilities of the existing applications. More functionality, less sustaining support effort, and more security and longevity are needed for these critical applications. They cannot be discarded because of the key USAP work processes that they support. Because the database systems actually define the work flow and business processes that, in large part, define how the USAP will work, NSF will have a proactive role in the re-definition of these systems and an oversight role in the design of the replacement applications. New database systems are now being developed that are structurally outside of the legacy database environment, but which will have a need to access/share/modify the legacy database records. This heightens the needs for a structured, integrated approach to the development of an Enterprise database management/data warehouse architecture to prevent stovepipes and fragmentation in information collection, processing and dissemination.

C7.5.3 Research, Design and Engineering

NSF expects the contractor to function as an applied systems engineering house and to take an expansive view of the process of systems design and development. This will entail contractor involvement in a continuous cycle of research, design and engineering as described below whenever new systems are to be defined for implementation for USAP.

C7.5.3.1 Research and Innovation

For the Information Technology infrastructure as applied to computing systems, the contractor will be required to design, develop, implement and maintain certain data and computational systems to meet program needs that are often not readily satisfied using off-the-shelf systems and packages. Nonetheless, such activities should utilize commercially available base systems, or at a minimum, development tools that are well-known in the IT community. . The contractor will assist the USAP by maintaining a working knowledge of such commercially available technologies and systems. The exception to this guideline would be in a specific case where the nature of the work to be accomplished by the system, such as in an area of scientific computation, is such that there are no widely used tools available. In such cases, the contractor will still present to USAP a design and development plan that highlights and justifies the need to use approaches and/or tools which are novel or not commercially available.

For communications systems, the preference of the NSF and USAP is to utilize off-the-shelf communications components and software systems wherever they are available and adequate for the purposes to which they are to be applied. The contractor will be expected to assist the USAP by maintaining a working knowledge of commercially available technologies and systems, through methodical research and an awareness of associated industry innovations. The contractor should also be able to recommend those which would be appropriate for use under the conditions of the program. As required, the contractor will analyze program requirements for new or upgraded components and systems and will recommend to USAP the appropriate candidates for acquisition. This analysis and recommendation cycle will occur when existing systems need to be replaced, or new requirements for data and systems work lead to the need for systems to be purchased for the first time. The contractor will also consider the adoption of NSF-standard software, where appropriate, in order to facilitate the sharing of information with OPP.

C7.5.3.2 Systems Engineering for Development, Testing and Evaluation

NSF requires that the contractor apply well-formulated systems engineering, development, testing and evaluation techniques when conducting design and engineering tasks for the USAP. These functions are to be considered formal, structured activities with well-defined sequences of steps, and the delivery of interim as well as final work products that will allow for appropriate input and feedback from NSF. Bidders are encouraged to describe their proposed approach to the systems engineering tasks. Further description of how testing and evaluation are proposed to be addressed by the bidder should also be included.

The need for the design and development of large numbers of elaborate database and software applications is expected to be limited. Most of the anticipated development effort in this area will involve the upgrade and/or replacement of major program support applications such as MAPCON (inventory tracking), PTS (personnel tracking), CTS (cargo movement tracking) and Power 1000 (procurement).

C7.5.4 Systems Implementation and Deployment

The implementation of information technology systems for USAP is entirely the responsibility of the contractor. The USAP IT Enterprise Long Range Implementation Plan, referenced above, will provide the specific plan for the implementation of individual systems. It is anticipated that the implementation of some systems will span multiple years. The specific technology requirements and the skills and expertise required to conduct the implementation successfully will vary according to the nature of each system.

The contractor is expected to maintain an appropriate balance between the on-staff and external resources needed for implementation activities. Part of this balance will be to have sufficient on-staff resources to properly maintain all operating systems. Effective training of technical personnel in how to maintain these systems, and providing access to specialized expertise that cannot be available full-time on-site is part of the contractor's responsibility.

Descriptions of major systems implementation issues, by technical area, are given in the following paragraphs.

C7.5.4.1 Telecommunications/Radio Communications

The contractor will have the responsibility for the procurement, design, installation, operation, maintenance and upgrade of Antarctic communication systems (exclusive of those systems used in aircraft operations). The degree of responsibility is dependent upon the location and inter-relationship of the systems in use.

For future communications systems development, the Contractor will be involved in hardware and software design and procurement, installation and interfaces with local, intra-continental and inter-continental networks. The operation of communication systems in McMurdo is partially shared with NASA through a contractual relationship established by NSF. The Contractor must establish an effective working relationship with NASA and shall assume full responsibility for communications at all other scientific stations.

The contractor will be required to respond to the following tasking:

Provision of End-to-End Satellite Telecommunications at McMurdo - In keeping with the USAP External Panel recommendations, and in order to provide a more effective and seamlessly integrated telecommunications services to McMurdo, the source of the satellite communications contract, and its associated CONUS tail circuits, is to be shifted from SPAWAR to the contractor. The contractor will be required to provide the INTELSAT space segment, CONUS common carrier interconnects, CONUS private network management, and tail circuits such as the link to NASA's Ames Research Center.

McMurdo Telecommunications/Telephone Central Office - The level of service, the technical skills required, and the complexity of the various systems involved in providing the McMurdo telephone service (including the off-station common carrier links via satellite) have progressed to the point where it is required that professional

telephone staff and management provide this service. . The contractor may elect to sub this function out or to include a Telephone company (Telco) as a teaming partner. Regardless of which approach is adopted, the telco functions must have a qualified talent pool from which to draw. There would be synergies and advantages for a Telco to provide service in McMurdo, such as wrapping the requirement for INTELSAT/CONUS communications into one integrated group with the specific organizational culture/experience focused on this particular technology.

Space Operations and Communications (Telemetry, Command, and Teleport Operations/Services for LES-9/GOES-3 and any other special communications satellites) - This tasking is in response to the USAP External Panel Report recommendation to consolidate support functions. It is also a strategic move to provide the USAP with these unique communications services for the future. NSF is currently vulnerable to a major disruption or long term loss in service should key people affiliated with the current sub-contractor retire or become ill. The dependency of the USAP on these systems, and their technical integration into the rest of the USAP telecom infrastructure has grown to the point that it is critical that they are adequately staffed. The contractor is required to provide personnel for this task who possess the right skills/expertise to fulfill the needs of this function.

24x7 Enterprise Network Operations Center - The steady increase in global communications that must be provided 24 hours a day, 7 days a week to link the various Antarctic and non-Antarctic locations and work centers, and aboard the research vessels, indicates that the contractor will need to operate a combined telecommunications/data network/customer support desk operations center in CONUS. Adding to this requirement, there is an increasing set of customer service needs and demands (such as quicker fault resolution, greater circuit reliability, etc.), and the need for an effective interface to the NASA telecomm networking environment for the NSF-NASA joint venture/mutual support/services already in place. The contractor is required to manage the global USAP enterprise data/telecommunications infrastructure to meet these needs and requirements adequately.

CONUS Applied Technology Development, I&T Center – There is a long term need for the contractor to have an in-house “hands-on” technical capability located in CONUS. This will eliminate equipment prototyping and testing in Antarctica, where resources and technical talent are limited. This will also allow for better pre-deployment support to grantees who are developing, or are having the contractor develop, instrumentation, software, communications systems, power systems, etc. It would allow the contractor to take suggestions for technical improvements that come from field operations, test them, and translate them into a production device. Judicious use of out-sourcing for production mode development is envisioned. The Contractor would be expected to limit proto-typing to one or two of an item. Environmental (temperature, altitude, shock/vibration), ergonomics, and interface testing for Antarctic-based systems could be performed. The ability to develop/test small scale technical designs to meet needs that cannot be met or are poorly met by conventional commercial off-the-shelf systems is envisioned. Simple design work consisting of subsystem integration is the prime objective, not elaborate and costly R&D. The intended scope of this effort is applied, rather than research-oriented, in nature. This will eliminate the need for NSF to look beyond the contractor to other Government agencies for routine levels of support. Shore support of the R/V data acquisition systems and special purpose marine technology instrumentation must also be supported. The Center could support the technical aspects of pre-deployment readiness reviews or compatibility reviews of grantee developed instrumentation.

C7.5.4.2 Data Communications and Networks

The contractor is responsible for all IT Infrastructure deployment tasks at the Antarctic stations, contractor headquarters and at the off-continent staging areas (Port Hueneme, Christchurch, and Punta Arenas), as well as on the research vessels. This work will be done either directly by the contractor, or under the direction and supervision of the contractor. All systems will be deployed according to approved plans, and using equipment and applying standards that are detailed in planning documents developed by the contractor.

The contractor will be expected to plan for communications and computing network upgrades and replacements based upon well-articulated life cycle predictions, and to take into account technical advances and budgetary limitations. The planning for the implementation of systems will include provision for appropriate levels of staffing in those areas of technical competence required to ensure successful system delivery.

C7.5.4.3 Computing Systems

Computing systems used by USAP include those which are intended for both general and specialized purposes. A list of such systems currently used by USAP can be found in Section _____. The contractor will be required to implement new systems and to upgrade existing systems on a planned basis.

C7.5.4.4 Database and other Software Systems and Applications

The USAP has an on-going need for a range of database and other software systems and applications to support its work. The preference of NSF/OPP is to adopt commercially available and "industry standard" software wherever it is practical to do so and does not diminish the ability of the applications to deliver the required functionality to system users. General applications such as word-processing, spreadsheets, and personal-computer-based relational databases will be made available at computer workstations, either locally, or as installed on network servers. Other specialized applications, such as MAPCON, Power1000, CTS and PTS (or their eventual replacement systems), which have been developed for USAP to address particular operational requirements, are to be maintained on designated workstations. Similarly, scientific applications which are used to support grantee work are installed and maintained on computers which are used by grantee personnel and contractor personnel who work with them. These stations are found in the laboratories, on the research vessels, and in computing equipment sent to support field work.

The contractor will be responsible for the installation of these applications, and for establishing adequate procedures for the training of users, the regular archiving of data and all other such tasks as are necessary to guarantee that the applications are properly used and maintained.

C7.5.4.5 General Purpose and Mission-unique Electronic Technology

The contractor will be required to install and initiate the use of a wide range of electronic equipment used by USAP to support its work. This will include antennas, radio transmitters and receivers, satellite communications circuitry, modems, routers and switches for voice and data communications, etc. The contractor will be expected to have available properly skilled staff to execute the installation and implementation of this equipment, and to successfully integrate it into new and/or existing IT infrastructure systems.

C7.5.5 Technical Operations

USAP systematically uses Information Technology, consisting of communications and computing systems, in all operations. This includes science support, communications control, office administration, and supply and inventory. Computers range from desktop PCs to DEC MICROVAX units. Communications systems include telecommunications, radio communications, common carrier, satellite tracking and data acquisition and video/CATV systems. The contractor is responsible for all required system operations, maintenance and upgrades, including hardware and software, and systems capability.

The contractor shall conduct training courses for contractor staff and all other program participants to insure effective use of computer hardware and software, especially for newly developed in-house software designed to network departments. The training and development of user-friendly operating procedures and manuals must lead to work products which are understandable to all who will use the systems, including researchers, outside management, and other support agencies.

C7.5.5.1 Telecommunications/Radio Communications

Telecommunications and radio communications systems for which the Contractor will have principal responsibility are presented in Section _____. Types of systems include:

satellite communications, covering multi-channel digital voice and radio programming, private trunked lines, public network links, etc.;

telephony/switched voice communications;

radio communications consisting of radio telephone, radio paging and other PCS technologies, local land/maritime mobile radio, short and long range HF radio for field, ship and inter-station communications, VHF land mobile radio, UHF radio composite voice transmission systems, etc.

radio antenna farms, radomes, dish antennas up to 13 meters, HF and microwave relay towers, repeaters, etc.

Responsibilities extend through the maintenance of earth power and signal relay stations. The contractor must maintain the wire and cable plants at all Antarctic stations and remote sites, as well as at the airfield facilities in the McMurdo area.

C7.5.5.2 Data Communications and Networks

At each station, aboard the research vessels, contractor headquarters, and at all staging areas, the contractor will be responsible for the installation of computers and networks, their operation and maintenance. Of particular concern is the need to ensure that the Contractor has highly skilled IP networking engineering and operations personnel on staff, both in CONUS and at selected field office sites (Christchurch, McMurdo, and South Pole).

The contractor is responsible for the cabling of all networks, including LAN, MAN, and WAN configurations. This responsibility includes the placement of hubs, routers and any other network hardware required to establish and maintain the network's operations. The contractor will operate, support and maintain the USAP World-Wide Web Intranet and Extranet. In the laboratories, the contractor will maintain the necessary data collection connections between scientific measuring equipment and the laboratory computers. The contractor will ensure that there are sufficient amounts of consumables including disks and data tapes to fulfill the needs of the science teams.

The contractor will also take responsibility for the central network hardware and the peripherals attached to the computing networks, as well as other office automation appliances. This includes servers, printers, scanners, fax machines and photocopiers. As part of the contractor's science support responsibilities, all science research and operations specific peripherals will be operated and maintained. This includes large format plotters, digitizers, notebook computers, dye sublimation full color printers, digital cameras, portable computing mass storage devices and CDROM authoring systems. All required data acquisition and instrumentation verification in the laboratories and on-board the research vessels will be undertaken by the contractor.

C7.5.5.3 Computing Systems

The contractor is responsible for the operation and maintenance of all USAP computing systems and associated general use systems. This includes e-mail, standard office automation suites (MS Windows, MS Office and other legacy systems), centralized backup and restore file systems, World Wide Web connectivity software (TCP/IP protocol support, etc.), and Internet browsing systems.

The operation and maintenance of other systems that are used by specific groups of users are also the responsibility of the contractor. Among these are: specialized operating systems (such as UNIX), engineering and CAD workstation systems, point of sale applications (used in the station stores), and meteorological information systems used by air operations.

C7.5.5.4 Database and other Software Systems and Applications

Among the common information and data systems that are to be maintained by the contractor are the following: the Inventory and Maintenance tracking system (MAPCON); the personnel tracking system (PTS); the cargo tracking system (CTS); the POFMS system; and, the purchasing system (Power 1000). Descriptions of the full list of current implementations of USAP computing systems is included in Section ____.

The contractor also is required to operate and maintain software systems and applications for finance and accounting, medical records management, and other purposes.

C7.5.4.5 General Purpose and Mission-unique Electronic Technology

Among the general purpose and mission-unique technology to be operated and maintained by the contractor are:

an Automatic Teller Machine closed network (currently leased from Wells Fargo Bank);

Broadcast and media equipment, including CATV and broadcast radio studio set-ups;

a variety of “tenant systems”, including NOAA orbitography beacons, NASA ground stations and satellite tracking and data acquisition systems, SPAWAR weather office systems, USAF Technical Applications Center and communications relay, JPL and UNAVCO GPS systems, and a university meteorology research workstation.

The full set of systems is presented in Section _____.

C7.5.6 Customer Services

Customer services are those activities where IT staff assist and support the work of other USAP program participants. These services include: direct interface support, such as customer equipment issue, customer training, customer mission planning support; operational functions, such as running the dispatch/communications center; and value-added services such as radiotelephone patching or science field mission planning support. A further distinction can be made among the support of science activities (interfaces with grantees), the support of non-scientific IT efforts, including administrative tasks, and the dissemination of information within USAP and to a wider audience.

C7.5.6.1 Science Support

The conduct of science within the USAP relies heavily upon the availability of computing and communications resources to collect and organize data, analyze it, and transport it to other locations for archiving and/or further analytic work. The contractor is required to work closely with grantees to plan for their computing and communications needs. The contractor will educate grantees on the standard computing and communications facilities and equipment that are available at antarctic stations. The contractor will also be expected to supply grantees with hardware, software, specialized computing assistance, and hands-on installation, calibration, maintenance and operation of systems and equipment, according to grant needs and budgets.

A detailed description of the currently installed IT infrastructure which is meant for science support is given in Section _____. Generally, each grantee will have access to laboratory space and/or field equipment while their work is being done in Antarctica. Laboratory spaces are equipped with personal computers, with network access to printing and remote communications resources. All laboratory buildings are fully wired for telecommunications and networked computing. Research vessels are similarly wired, and have communications systems on-board which allow for access to remote sites for messaging and/or data transfer. Field parties are issued computing and communications equipment to supplement whatever they bring with them, in order to ensure that they have the facilities available to carry on their research.

The contractor will provide sufficient staff to support implementation, maintenance, operations and training activities involved with all communications and computing that is done in support of science. Specifically, this includes the use of contractor staff to conduct on-going scientific work, data collection, data analysis and data transmission for grantees who “leave behind” equipment to continue experimentation after they have left Antarctica. All such support is planned for and agreed to among the grantees, NSF and the contractor as part of the grant planning process. Staff assigned to science support functions should be familiar with university-based IT/IS requirements and standards, with a particular emphasis on the conduct of research and the analysis of data results.

C7.5.6.2 General Technical (Non-science) Support

General technical support, other than that associated with science support, includes installation, technical control and operation, maintenance and repair, and de-commissioning of computing and communications systems that are used for administrative and operational functions within the USAP. This includes all telephone, radio and computing systems linking contractor headquarters, staging centers, Antarctic stations, the research vessels, NSF offices, and other organizations affiliated with the USAP, both governmental and private sector. A complete listing of all systems under the care of the contractor is given in Section ____.

C7.5.6.3 Information Dissemination

The contractor is responsible to act as the primary interface with all external parties regarding on-going USAP activities. This includes assembling and disseminating information on grantee work, the grant process, and general facts about the operation of the program.

The contractor will maintain an Internet Web-site on behalf of the USAP. The specific contents on that site will be determined in consultation with NSF, but the site itself will be updated and operated by the contractor.

The contractor will develop and disseminate information about USAP activities through multiple channels, some of which are described elsewhere in Section ____.

C7.5.7 Specific Tasking by Location

The following are the tasked responsibilities of the contractor for Information Systems/Information Technology (IS/IT) and Communications functions. They are presented by location and/or time of year. Port Hueneme functions are year-round. McMurdo has special requirements during the pre-summer season Winfly period. South Pole and Palmer stations share many of the tasks that are required at McMurdo, but on a smaller scale. In addition, these two stations have a set of tasks that are not common across all stations. The research vessels are generally self-sufficient with respect to IS/IT and communications, but support most of the basic functions present at the continental stations in some fashion.

C7.5.7.1 Port Hueneme Tasking

The contractor will be responsible for maintaining all IT systems at Port Hueneme. This will include tasking in both telecommunications and information systems. Telecommunications-related tasks will include the following:

- Maintain PBX system

- Provide communications support

- Provide technical support to Navy and Air National Guard units involved with operations at Port Hueneme

- Information and computing systems tasks at Port Hueneme will include:

 - Maintain Network O/S Hardware and Software

 - Maintain e-mail services

 - Provide user support

 - Maintain networked workstations

C7.5.7.2 McMurdo – Winfly (Pre-season activities) Tasking

During the Win-fly period at McMurdo when the station is transitioning from winter to summer operational mode, there are specific activities which must be completed by the contractor's IT staff prior to the arrival of the mainbody of summer program participants. These are detailed below, and separated between telecommunications and computing activities.

C7.5.7.2.1 Telecommunications

Telecommunications tasking for Win-fly cover activities at the field party and receiver shops, communications support, antenna work, Mac-Relay operations support, AFRTS operations support, T-site support and general telecommunications tasks.

Field Party Shop and Receiver Shop tasks will include:

- Ready equipment for main body issue

- Maintain hand-helds, HF radios, UPS's, pagers, vehicle radios, batteries and repeaters

- Commence issue and tracking of equipment

- Provide support and training to personnel and science groups

Communications support tasks include:

- Install micro-wave radio equipment for MRSF and LDB

- Ready Opta-phone and Ritron radio telephones for summer deployment

- Continue NASA support as necessary for TOMS-EP, LML V/Lewis

- Perform on-going routine maintenance on communications equipment

- Assist telecommunications group with preparations for early Main-body events at Black Island or elsewhere

Activities related to antenna support will include:

- Inspect and repair winter tower and antenna damage at T-site, Black Island, etc.

- Ready tools and rigging equipment for season

- Develop plans, collect materials and prepare for fabrication of any new towers or tower modifications scheduled for the season

Mac-Relay operations can be expected to require the following types of support activities:

- Familiarize and train with personnel for up-coming season

- Review SOP's and other publications. Revise as needed.

- Create shift schedules and work guidelines

- Create training program for Main-body arrivals

Air Force Radio Television Service Operations will involve the following tasks:

Familiarize and train with personnel for up-coming season

Monitor and maintain television and radio broadcasts

Keep public information channels (scroll) updated and current

T-site support will include the following types of effort:

Verify communications inventory

Familiarize and train with personnel for up-coming season

Provide 24x7 coverage on HF, VHF, and UHF transmit/receive communications for McMurdo, field parties, MAC-Relay, MAC-Center, and MAC-Ops.

Telecommunications support tasking includes:

Stay current with LAN and telephone move, add and change requests and Long Distance restriction management

Perform daily maintenance of all telecommunications systems in B-182

Assist communications with Black Island-related events

Ready communications equipment for installation at MRSF and LDB

Survey all OSP cables and H/W for winter damage and schedule repairs

Run current list-ups on all PBX's and file for summer reference

Begin collecting current information for new telephone directory

C7.5.7.2.2 Computing and Data Systems

The contractor will provide Winfly support in the computing and data systems areas that involve network and computer support. Network support activities will include the following:

Complete set-up of Winfly personnel network and desktop accounts and conduct bind-fix and bind-synch after creation

Continue with account creation for Main-body passengers on first six flights

Identify and fix printer queue problems

Complete full back-up of Terra Scan files and scripts and prepare for upgrade

Train new Network administrator(s) on existing Network

Assess Network OS for need of upgraded NLM's and VLM's

Apply upgrades to all systems, including e-mail, network O/S, etc.

Evaluate new releases of software and ascertain what patches are necessary to install the new version. Install new software releases and work out bugs.

Ensure that LAN and hubs are complete per LAN design plan

Computer Support tasks will include the following:

Once spares are received, repair computers throughout station

Move winter-stored computers back to original locations and ensure configurations and boot disks are current

Train new technicians on SOP's

Reconnect printers to printer queues and network and test

C7.5.7.3 McMurdo – Summer Season Tasking

The sub-sections below outline the standard set of tasks that are conducted during the Austral summer season at McMurdo Station.

C7.5.7.3.1 Telecommunications

Telecommunications functions to be provided by the contractor include tasks for: Systems, Technical Operations Support, Customer Services, Black Island Technical Management, General Communications Support, Antenna Support, Telco, Systems Engineering and AFRTS support.

The contractor will be responsible for the full range of radio communications operations, maintenance and services functions. This set of functions supports the communications requirements of the contractor, NSF, the grantees, SPAWARS and the NYANG. These tasks are currently performed out of a variety of locations at McMurdo including the field party shop, the Field Operations Communications Center (Mac-Ops), McMurdo Relay (Mac-Relay), and T-Site. A complete list of the radio communications systems currently installed at McMurdo, for which the contractor will assume responsibility can be found in Section ____.

The contractor will be responsible for the operations and maintenance of the radio communications systems at McMurdo, which includes:

HF radio;

Land and Maritime Mobile radio;

Paging;

Radiotelephone;

PCS technologies.

The contractor will provide technical operations support at McMurdo station that will include:

Radio technical control;

Facilitation of RTTY traffic between McMurdo and South Pole;

Routing of USANG message traffic;

Conduct of ship to shore HF radio traffic;

Receipt and processing of incoming faxes and INMARSAT calls for Building 165;

Administration of the HF/G e-mail message system;

Maintenance and repair of equipment.

The contractor will be required provide a range of support services for the community of McMurdo users (customers). This will include:

Equipment issue to customers;

Customer training;

Mission planning support;

Operational functions in support of customers, such as dispatch/communications center operations;

Value-added services such as radio-telephone patching, and science field mission planning support.

The contractor's IT staff will be responsible for all of the tasks involved in the technical management of the Black Island Telecommunications facility. This involves the following:

Coordinate traverses and helicopter transport

Conduct housekeeping

Coordinate engineering support and maintenance

Maintain and repair USES system

Support HF radio

Support Wonderware software

Support NASA MTRS system

Support T-events, V-events, and engineering projects

Support AFRTS satellite feed and transmission equipment

The contractor will assume responsibility for a range of communications support functions including:

Maintain and repair UHF radio telephones, including Crater Hill base stations, mountain-top repeaters, and field camp subscriber units;

Maintain and repair UHF Ritrons at Ice Tower, Pegasus and Marble Point;

Support deep field camp communications;

Maintain and repair Quadralink and LR-4 micro-wave systems;

Install and maintain VHF repeaters in the Dry Valleys;

Maintain local VHF repeaters and base stations, including T-site and Crater Hill sets;

Maintain Mac-Ops HF, VHF and audio systems;

Provide support for NASA projects, including TOMS, NAILS, Sea Star, Radarsat, and MTRS;

Support AFRTS digital feed as necessary;

Support communications for Petroleum Helicopters, Inc.;

Maintain McMurdo ATM's. Note that the current ATM machines are furnished free-of-charge to USAP through an arrangement with Wells Fargo Bank. NSF wishes to continue to have electronic banking services made available at McMurdo, as well as at South Pole and Palmer stations. The contractor will be expected to arrange for these services, or equivalent substitutes to be continued.

The contractor is responsible for the erection and maintenance of Antennas at all stations and field camp sites. This involves tasks such as the following:

Maintain and repair T-site towers, curtains, guy wires, cabling and new installations

Test and provide annual maintenance of McMurdo antenna system

Support Telco cabling projects

Maintain antenna system for AFRTS live feed

Maintain and repair Black Island towers, curtains, guy wires, wind generators and radomes

Install and maintain towers and antennas at field camps

Provide antenna support to NASA MGS and MTRS radomes

Support heavy shop overhead cranes

Maintain Arrival Heights receive site antennas and lines

Maintain and repair Christchurch towers, curtains, lighting, guy wires, and cabling

Maintain and repair South Pole towers, curtains, guy wires, cabling and new installations

Telephone system operations require the following tasks to be performed by the contractor:

Install and repair McMurdo telephones

Install and repair McMurdo cable TV

Install and maintain LAN cabling and drops

Install and remove cables on Crater Hill as required

Update McMurdo cable plant fiber and UTP as-built diagrams and documents

Provide voice and data service to the Mobile Support Runway Facility

Program and maintain the Telco PBX

Provide OSP and ISP support, engineering and estimates

Maintain Telco inventory and records

Support New Zealand Telecom as required

Specific in-season systems Engineering tasks that are the responsibility of the contractor will include:

Provide McMurdo-based project engineering for new initiatives

Collect information and produce as-built drawings

The contractor will have the responsibility to support the AFRTS functions. Specific tasks would include the following:

Conform to regulations in DOD 5120.20-R

Monitor and maintain TV and radio signals and feeds with Black Island

Maintain information scroll channels and update community information scroll

Provide and supervise live radio programs with volunteer talent

Provide local movie channel with films

Coordinate and support program events, as required

Provide repair and preventive maintenance of AFRTS equipment

C7.5.7.3.2 IT/IS Systems

The contractor will provide support for IT/IS systems in the areas of network support, general computer support, user support, science support and systems engineering efforts. Network support activities will include the following:

Support the external connectivity (WAN) functions of the network infrastructure.

Administer LAN access at McMurdo

Support local LAN and e-mail administration for the R/V's N. B. Palmer and Laurence M. Gould

Support the Black Island remote link

Provide LAN e-mail support and administration

Maintain and administer the UNIX system and network

Support the UNIX weather system

Provide technical support for the Terascan system

Support IS Computer Engineering

Clean-up and provide prevention for viruses

Support South Pole IS as required

General computer support to be provided by the contractor will include:

Assemble computers

Install and repair hardware and peripherals

Configure laptops and other computing equipment

Install and support PC Operating systems

Install software upgrades and revision changes

Support desk-top applications

Install, maintain and repair photo-copiers at McMurdo and South Pole

Clean, create and inventory boot disks for workstation computers

Provide computer support to communications projects

Maintain NSFA's Telemed/Telaradiology system equipment

Support SPAWARS projects as required

The contractor is required to support computer users in the following ways:

Conduct training for all personnel in computer-based operations and general applications systems such as e-mail, LAN O/S, Windows, Telnet, and FTP

Conduct training for specified personnel in use of applications systems such as inventory, cargo and personnel tracking, and specialized science data collection and analysis packages

Train work center trainers for computer applications

Provide user support for Windows applications and Operating systems

Provide general software support

Provide user support for other installed systems

Provide help desk support for CSEC and McMurdo users on general computing, printer configuration, LAN, e-mail, UNIX, Telnet and FTP

Provide station management and administration with computer assistance

Assist in the computer inventory process

Science support tasks will include:

Provide system and user support for applications used in science programs

Prepare and transfer files

Monitor and maintain file transfer system

Create and monitor specific applications' user accounts

Support users during ship off-load

Winterize systems before end of season

Systems Engineering tasks will include the following:

Provide McMurdo-based project engineering for new initiatives

Collect information and produce as-built drawings

C7.5.7.4 Specific Palmer and South Pole Tasking

Although the majority of activities under the contractor's responsibility for IT-related functions are replicated at all of the Antarctic stations, there are specific tasks which are required only at South Pole and/or Palmer stations. These are listed in the following sub-sections.

C7.5.7.4.1 Telecommunications

Telecommunications activities that are specific to the South Pole and/or Palmer Stations include the following:

Provide HF radio technical communications support

Provide VHF radio technical communications support

Provide S-band satellite technical communications support

Provide emergency technical communications support

Provide HF antenna technical support

Provide telephone technical support

Provide meteorological electronics support and equipment repair

Provide general station electronics support

Provide small boat communications services (Palmer only)

Provide HF/VHF internet communications support

Provide trouble desk activities

Provide relay search and rescue communications

Operate satellite systems

Coordinate and support grantee communications

Perform flight following activities (South Pole only)

Transmit and receive HF radio telephone (South Pole only)

Monitor NGA flights (South Pole only)

C7.5.7.4.2 IT/IS Systems

IT/IS systems activities that are to be conducted at South Pole and Palmer Stations include the following:
Perform preventive maintenance on all computer equipment

Install and test new and relocated computers

Maintain computer and LAN equipment inventory

Maintain printers

Support miscellaneous computer field engineering services

Install and support PC operating systems

Plan and submit operation and maintenance documentation

Provide NOC and back-bone field engineering support

Support LAN, e-mail, Network O/S, servers, etc.

Provide network hardware and software support

Provide applications systems administration

Provide power logic circuit monitor data collection (South Pole only)

C7.5.8 Research Vessels

There are specific requirements for IT activities on research vessels which are the responsibility of the contractor. These include tasks in communications and in the information systems categories. They are explained in the next two paragraphs.

Communications tasks on the research vessels begin with the premise that the owner/operators of the research vessel Laurence M. Gould (ECO) have the primary responsibility for the communications functions between the ship and other locations. Aboard the Nathaniel B. Palmer, the ship owner and the contractor each are responsible for one of the two INMARSAT systems. Radio is the primary means of communications for the vessels, with the INMARSAT system being the primary link for both voice and data transmissions. The electronics technicians and/or computer technicians will provide auxiliary support to the crew of the vessel on an as-requested basis in the communications area.

Information Systems/Information Technology tasks include the contractor's responsibility for the installation and maintenance of all LAN and computer hardware and software systems on research vessels.

Each research vessel is staffed with contractor personnel who support the efforts of the grantees as they perform their projects. The technicians are designated into either electronics or computer functional slots in the support crew. The technicians operate electronic and computer equipment, are responsible for data collection and archiving, may assist in data analysis tasks, and on occasion, write programs to support grantee work.

C7.6 Facilities Engineering and Construction

C7.6.1 Management

The contractor is responsible for facilities engineering and construction program-wide. Most construction and renovation work takes place at the US stations in Antarctica although the contractor can be tasked with managing such work for US facilities in New Zealand and elsewhere. This responsibility ranges from coordination with Architect & Engineer (A&E) firms selected by NSF for major construction, to design/build of smaller projects to planning, management and execution of all NSF-approved facilities renovation and new construction projects. Specific responsibilities follow.

C7.6.2 Engineering

C7.6.2.1 General

The contractor shall provide the resources to respond to NSF requests for major and minor design and engineering services as described below. Resources shall include engineers, drafters, estimators, schedulers and surveyors in the numbers and disciplines required for engineering and construction projects approved in the annual program plan. When stamped drawings or other certifications are required, the contractor shall provide professional engineer (PE) services.

The contractor shall produce design and as-built drawings in the AutoCad formats and versions specified in Section J, Attachment J-__ . Related computer hardware and software is GFE, and maintenance, operation and, as appropriate, upgrade of this equipment will be a requirement under the next contract.

The contractor shall provide a scheduling and estimating capability sufficient to produce timely and accurate schedules and estimates for the types of projects discussed below. This capability shall include competence in current scheduling and estimating software programs (Primavera, R.S. Means, Timberline, etc.). Several of these programs are GFE (see Section J, Attachment _).

The contractor shall maintain a year round engineering capability of sufficient size and technical proficiency to meet annual program requirements. During the austral summer, an office and field engineering staff shall be maintained at McMurdo Station (Building 175), with engineering personnel assigned to South Pole and Palmer Stations as required. The contractor's primary engineering responsibilities at each station are listed below:

Manage the engineering required for station facilities and utilities construction/renovation which are approved in the annual program plan; provide follow-on engineering support of facilities/systems O&M after construction/renovation is complete.

Provide the on-site surveying for engineering and construction, including specialized O&M support such as measuring and monitoring temperature and thickness of the sea ice runway and ice roads at McMurdo.

Coordinate any design modifications, etc., with NSF and/or PACDIV; submit any proposed changes for approval beforehand.

Maintain and update a technical library including O&M technical manuals, facilities descriptive books, and a submittal register of NSF-approved materials and finishes.

Review construction drawings and specifications to assure compatibility with existing system components and spares, including manufacturers' ability to support their products in the future.

Regularly inspect station facilities for damage and/or defects such as electrical and plumbing deficiencies or safety hazards; identify solutions and, as requested by NSF, prepare formal designs/estimates for correction/upgrade.

Conduct pre-final inspections of new or renovated facilities prior to Government inspection/acceptance.

Produce as-built drawings that accurately reflect new construction as well as renovations or modifications to existing buildings.

The contractor shall periodically survey the engineering and construction industries with the purpose of identifying new design features, materials, construction methods, etc., that could be used to improve station infrastructures, reduce costs or otherwise benefit USAP operations (see Section C7.1.7).

As much as possible, NSF tries to develop long-range plans for the improvement of USAP infrastructure. Such plans depend on capital funds, which are often difficult to obtain as part of the annual USAP appropriation. Instead, the contractor and NSF must work to conserve and maintain the existing infrastructure, and make incremental improvements each year. Of necessity, therefore, the contractor must address the following restraints and concerns when planning improvements:

Limit the physical size of stations and camps to keep utility and circulation requirements to a practical minimum;

Consolidate like functions in the same operational areas;

Group operational functions that require frequent or continual interface within the same facilities;

Developing an annual construction program that ranks projects and completion dates by NSF priority;

Plan physical layouts that keep energy, equipment and manpower demands to a practical minimum, and include utility systems that can be easily winterized and restarted;

Develop an annual construction plan that does not adversely affect station, ship or aircraft operations;

Ensure that construction projects comply with provisions of the Antarctic Treaty and all applicable health, safety, and environmental standards;

Develop a plan to remove outmoded, unsafe or otherwise substandard facilities as part of the annual construction program.

C7.6.2.2 Major Design

For major projects (presently those with an installed cost of over \$500,000 that require detailed planning, extensive logistics support and dedicated funds), a design contractor (A&E) is retained under a separate contract negotiated by the US Navy Facilities Engineering Command's Pacific Division (NAVFAC PACDIV) on behalf of NSF. PACDIV is NSF's engineering manager for major design efforts and, depending on the project, also provides owner representative inspection services on-site.

The contractor is required to coordinate with PACDIV and the A&E from the earliest stages of a major design project, actively participate in all constructability reviews, and provide value engineering recommendations as appropriate throughout the process. The contractor shall assume this interface/review responsibility for several major "in progress" projects when the next contract begins - principally the South Pole Modernization Project (see Section C7.6.4)

C7.6.2.3 Minor Design

For minor projects (presently those with an installed cost of less than \$500,000) the contractor provides design and engineering as well as construction services. As required by the size and complexity of individual projects, the contractor is responsible for some or all of the following: developing a design schedule, construction schedule and

cost estimates; producing drawings and specifications that meet NSF requirements; scheduling and conducting constructability reviews at the end of each design phase with NSF and any other participants; and incorporating value engineering criteria as appropriate to reduce installed costs.

The contractor is expected to take advantage of the “fast track” possibilities inherent in design/build work and to provide integrated management of such projects from the initial design through final inspection. Similarly, the contractor shall maintain the on-site capability to manage any NSF-approved field changes to a design.

Most minor design projects entail the renovation of existing facilities or the execution of new construction, such as the erection of field camps or portable buildings. Typical projects include interior remodels, utilities upgrades, construction of small pre-engineered structures, and exterior retrofits such as new overhead doors, loading docks, etc.

Section J, Attachment J-__ provides a representative list of the design work provided by the contractor during FY 98, including: the types (new construction or renovation) and dollar values of projects undertaken; the engineering disciplines employed; the number of field changes; and, the number of finished design and as-built drawings produced for each project.

C7.6.3 Construction

The contractor shall maintain a year round construction management, scheduling and estimating capability. At present, the annual USAP construction budget, exclusive of the South Pole Station Redevelopment Project (see Section C.7.6.4), is about \$2 million. This sum is for new construction and renovation at the three stations. Field camp construction is a science support budget line item, with the trades skills to build and take down field camps provided from the construction workforce. Major projects planned for the next several years, some of which will be in progress when the new contract begins, are listed in Section J, Attachment J-__ .

All new construction as well as exterior/interior renovation of existing structures at USAP locations requires NSF approval. NSF and the contractor plan construction according to NSF determined priorities, although the contractor is expected to provide both short-term and long-term recommendations for the order and precedence of work. Construction can be scheduled for the summer and winter seasons (or any combination thereof). In recent years, most McMurdo construction (even outside work) has been executed in winter, in part to ease the housing and general population burden during the summer. Because of the extreme cold, major outside construction at South Pole is usually limited to the summer although some exterior work can be completed in the twilight periods before and after the midwinter darkness. At Palmer, construction can be executed year-round, although ship schedules and on-site housing must be considered when planning large projects. It is the contractor's responsibility to plan the course of approved projects according to the seasons, and to ensure that needed materials and equipment are properly staged in advance.

Projects are scheduled as part of the annual program planning process, and can range from simple remodeling to complex multiple-year construction efforts such as the South Pole Redevelopment. Major projects typically will require formal design work, an assigned workforce, and detailed procurement and execution schedules. Minor projects (less than \$25,000) are level-of-effort tasks such as basic remodeling and workspace improvements, and field shelters which can usually be accommodated within the station operational budgets. In general, the contractor must plan and conduct construction work in such a way that the smallest possible crews are employed consistent with operational safety and trades skill requirements.

Contractor construction personnel actively participate in design review processes. NSF considers constructability and value engineering reviews to be especially important, and the contractor shall schedule and conduct such reviews for all projects, whether the design is the responsibility of an independent A&E or the contractor's own design entity.

The Contractor is also responsible for planning and executing construction in direct support of the annual scientific program (see Section C7.4.4). This work ranges from construction of major, remote camps that may support up to

100 people, to construction or modification, often on short notice, of smaller structures such as fish huts or similar shelters.

C7.6.4 South Pole Redevelopment

The biggest construction project during the next contract term is the South Pole Redevelopment Project (SPRP). The project involves the construction of a new station at the Geographic South Pole to replace the one now in use, is valued at over \$150 million, will be well underway when the new contract begins. The contractor is responsible for management of the entire project, including coordination with the A&E and PACDIV, all related procurement and logistics support, and on-site construction. Project requirements are described below.

SPRP is a two-phase program. The first phase is the South Pole Safety and Environmental Upgrade (SPSE) to improve facilities at the present station and renovate several of the existing arches for future service as part of the new station. The second, and larger, phase is the South Pole Station Modernization (SPSM), which involves construction of a new, elevated station (replacing the dome and related buildings) adjacent to the renovated arches. The entire program is funded by separate Congressional appropriations of \$25 million (SPSE, funded in total) and \$128 million (SPSM; with \$70 million funded to date).

By the time the next contract is awarded, parts of the SPSE (a new garage, new fuel tanks and new power plant arch) will be complete with components for the new power plant on-site. Construction of the power plant is scheduled to begin during the contract mobilization period with interior work continuing through the first austral winter of the new contract period. The contractor will assume responsibility for the remaining SPSE work as well as the procurement, transportation and staging activities associated with construction of the replacement station. On-site construction of the new station will begin in earnest during the 2000-2001 austral summer, the first full field season for the next contract.

When finished, the new station will feature approximately 95,000 SF of enclosed, heated space in two connected, elevated Pods (or buildings), and below-grade garage, power plant and warehouse archways. Each of the elevated station pods will contain three wings. The elevated station will connect to the power plant, cargo/warehousing and garage facilities constructed under the archways during the SPSE phase. The total unheated area will be about 40,000 SF. The contractor will be responsible for transition from the old to the new station (including incremental moves within the overall SPSE and SPSM schedules) as construction phases are complete, and successful commissioning of the entire station.

During at least the first three years of the contract, the contractor will manage an on-site workforce of approximately 80 construction workers during summer and a staff of about 25 working on interior projects during the winter. This workforce will generally be independent of the O&M staff; however, cross-utilization of employees is permissible and, depending on the contractor's management ability, desirable as a means of controlling population at the site.

The next contract will begin in the midst of a cost-loaded, multi-year SPRP construction schedule that involves some 1200 discretely managed activities. In many respects, on-site construction is the easiest part of this schedule. Each summer, the equivalent of 150 dedicated cargo flights will carry SPRP construction materials to the South Pole. Over the eight year construction period (which began during the 1997-98 summer and is scheduled to end in 2005), 20 million pounds of construction cargo will be shipped to the Pole. The contractor must manage this airlift according to the SPRP effort scheduled for each season. Therefore, procurement, transportation and the related logistical support required to stage construction materials and equipment at the South Pole in the order required and by the dates programmed in the schedule are among the most challenging requirements of the entire project.

Section J, Attachment J- ___ provides the summary schedules for the SPSE and SPSM, schematics and drawings of the new station, and a list of the principal manufacturers/vendors for the project. Also included is a description of the inspections which the contractor will be required to perform before accepting modular buildings, prefabricated components or other installed equipment from manufacturers/vendors.

C8. SYSTEM DOCUMENTATION

[To be added at a later date]

C9. PERFORMANCE METRICS

The Office of Polar Programs, National Science Foundation, intends to use performance measurement as a significant factor in determining a portion of the contractor's fee compensation under its forthcoming *Science, Operations and Maintenance Support* contract for the US Antarctic Program (USAP). The discussion below presents an approach to performance measurement that is under consideration by NSF for this contract. NSF will continue to develop its thinking about performance issues as they relate to the work to be performed under the referenced contract award, and will develop a proposed set of performance measures for the formal release of the RFP. Prospective bidders are encouraged to study the approach presented here, and to develop their own ideas of how project goals can best be met, and contractor activities most effectively measured through the use of performance measurement criteria. This will prepare the bidders to be able to work constructively with NSF to establish the final set of measures, should they be given the award.

The Balanced Score Card Approach

The currently accepted "Best Practice" approaches to performance measurement within the Federal government and across private industry highlight the utility of these methods in improving work products and increasing productivity. Properly designed and implemented, performance measurement factors can provide appropriate incentives for an organization to "work smarter".

Among the most attractive tools for performance measurement as applied to contract or project work is the "balanced score card". This methodology and terminology that originated with the work of Robert S. Kaplan, of the Harvard Business School, and David P. Norton, of Renaissance Solutions, a consulting firm based in Lincoln, Massachusetts. The balanced score card performance measurement methodology provides a management system to monitor and measure the overall, long-term performance of any organization providing products or services. The essential sections of the Balanced Scorecard are individual performance scorecards for each of the four major segments/elements by which the organization's effectiveness can be judged. These are identified as:

- Financial effectiveness
- Customer satisfaction
- Internal Business Processes
- Learning and Growth

Performance measurement and its results are usually used for determining the rewards allocated to an organization or an individual. A performance measurement system is designed to provide intelligent information and guidance for decision-makers who can use it to link actual performance with positive rewards, compensation or recognition. The performance measurements are meant to be positive rewards, not punitive actions.

A well-designed performance measurement process includes the following steps:

1. Define the goals and objectives for the organization or the program.
2. Establish critical areas of performance, and the "owner" who is responsible for achieving the desired goals and objectives.
3. Define key performance measures that are important in accomplishing the desired objectives or goals.
4. For each performance measure determine:
 - The measurement criteria that define what specific item or parameter gets measured.
 - Benchmark(s) against which the measurement is compared.

- What data needs to be collected, by whom, at what frequency and with what measurement method (yardstick) to arrive at the defined criteria?
 - Analysis method used to derive the result of measurement for the specific parameter.
 - The scaling factor that will be used to relate the performance result to the reward.
5. Collect performance measurement information for each defined measure.
 6. Calculate the outcome of each measure, including its scaled value.
 7. Group related measures within the elements/segments and establish a relative weighting factor for each measure within the grouping. This weighting factor is used to determine the actual reward for the group of measures as a portion of the maximum reward that could be associated with the element area.
 8. Determine the overall maximum reward base, and the proportion of this total that could be earned in each element/segment.
 9. Calculate the outcome of each element by summing the weighted values of each measure in the element. This is the score for each balanced element.
 10. Calculate the reward earned for each element, based upon its outcome total versus the theoretical maximum outcome total. The sum of these rewards is the total earned reward.

The USAP is a service-oriented program with special features and conditions including geographic remoteness and harsh operational conditions, high visibility within NSF, an established customer base, and special service (product) requirements for research grantees performing high level scientific experimentation. Because of this, NSF has taken a modified approach to the performance measurement elements listed above, and is proposing five elements for a USAP balanced scorecard. NSF believes that these five elements can be shown to encompass the total area of performance requirements for the contractor.

The five proposed elements or performance measurement areas are:

1. Financial performance
2. Customer satisfaction
3. Regulatory and policy compliance
4. Internal Processes
5. Program Innovations

For the USAP program, NSF has defined a number of important areas of performance. These suggestions are presented below. Work is being done to also identify related key performance measures, together with measurement criteria, benchmarks, definitions of the data to be collected as well as its analysis function(s), and suggested weighting factors to give appropriate prominence to each factor in relation to the others. This effort will be completed, and the complete performance measurement criteria set will be put forward in the forthcoming RFP.

Significant performance areas identified for measuring contractor performance follow.

Financial Performance

- Program budget:
 - On-time preparation
 - On-time submission
 - Completeness
- Financial reports
 - Accuracy
 - On-time submission
 - Completeness
- Budgeted versus actual expenditures
 - Science support
 - Operations
 - Maintenance
 - Overhead
 - Personnel
 - Subcontract

- Logistics and Procurement
 - Cost savings, both actual and relative (growth versus inflation or other measures)
- Personnel
 - Employee turnover
 - Training cost
- Subcontract fiscal performance arrangement
 - Cost reduction/Savings

Customer Satisfaction (Stakeholder Service)

- Service to NSF
 - Preparation and implementation of plans (long range, annual programs etc.): timely, accurate and complete
 - Assistance in grantee matters: pre-award, proposal selection support, science group meetings, grantee orientation, grantee support and grantee project success, post season briefings, etc.
 - Resource allocation
 - Submission of reports: quality, timeliness, accuracy etc.
 - Timely response to the special requests
 - Maintaining critical data bases; accuracy, timeliness, ease of accessibility, completeness
 - Response to emergencies
 - Public relations assistance
 - Project management assistance
 - Cost control
 - International relations
- Service to potential grantees – pre-award
 - Response to requests: timely, accurate information, completeness
 - Pre-proposal efforts coordination
 - Proposal resource requirements assessment and feedback
 - Communications (quality, timeliness, accuracy) with the potential grantees
- Service to Grantees
 - SIP preparation assistance
 - Project planning assistance
 - Assistance in preparation prior to departure (movement of cargo, etc.)
 - Pre-departure briefings and information dissemination
 - Pre-departure travel assistance and arrangements (scheduling and ticketing)
 - Housing arrangement en-route to Antarctica
 - Arrival briefing
 - Support during the stay including equipment support, training, etc.
 - Services: food, transportation, health, recreational etc.
 - Research support: quality, timeliness, adequacy etc.
 - Communication support: phone, e-mail, data transmission, radio, etc.
 - Information and data support: computing services and data acquisition
 - Predeparture briefing
 - Cargo-equipment handling
 - Sample handling
 - Off-site camp/research vessel support
 - Post-season follow-up
- Employees
- Subcontractors (long term contracts)
- Conference attendees
- International partners

- Visitors
- Other service providers and subcontractors- USANG, SPAWARS, helicopter services, USCG, NASA, RNZAF, NZAP etc.
- Other government agencies

Regulatory/Policy compliance

- Regulatory compliance and reporting
 - **Documents availability (On-site) including SOP's, Policy manuals, etc.**
 - **Definition of report requirements (OSHA, EPA, Antarctic treaty, Antarctic conservation act, international treaties etc.)**
 - Planning (Procedures, protocols, drills etc.) for disasters, accidents, mishaps
 - Safety related equipment: availability, operational checks on a preset schedule,
 - Communications – frequency to Grantee/residents/employee briefings and other forms of information dissemination.
 - Management of hazardous cargo: timely reporting and full compliance with proper procedures for packaging, labeling, transporting and disposal.
 - Monitoring of air and water quality to meet the regulations.
 - Record keeping and Reporting (accurate, timely, complete, easily accessible) as required by the applicable regulations and the policies.
- Personnel training: frequency, planning, execution
- Accidents – reducing incident events
 - Personnel
 - Vehicles
 - Equipment/property related
 - Aircraft and helicopters
- Waste generation: reduction of total generated due to improved waste management planning
- Recycling (percentage of waste) improvements
- Spills and leakage of hazardous waste (incident reduction)
- Quality problems (water supply, sewage, air, etc.)
- Health services
 - Inventory/availability of necessary medical personnel, facilities, equipment, medication etc.
 - Records keeping and transmission
 - Response time for the emergency needs for the station occupants/field teams and the research vessels
- Search and rescue operations: procedures planning, availability of search and rescue teams, equipment and response time to react to incidents

Internal Processes

- Annual operations plans: contractual matter coverage, on-time submission, completeness, schedule, manpower, subcontract, other interactions, communications with other supporting organizations
- Execution of the plans – meet NSF formats – requirements, periodic report submission, accuracy, earned value etc.
- Availability of key personnel as needed for the operations
- Work-force continuity/turnover minimization while maintaining quality of work-force
- Employee training
 - Prepare training plans for each group of employees
 - Prepare, submit and approve the training material/methods
 - Conduct training sessions – keep records
 - Testing of employees
 - On-site performance assessment on a routine basis
 - Supplemental training as/if necessary, either as refresher or to acquire new skills
- Quality control plans and execution: proper reporting and results
- Identification and use of new techniques for cost reduction, improved productivity, service etc.

- Publicity/media events plans and execution: timely, to the satisfaction of NSF and attendees
- Minimization of utility supply interruptions, quality problems, adequacy, etc. for water, electricity, communications, sewer system, waste collection etc.
- Handling of hazardous waste, etc.: instructions, training, proper handling, timely response to incidents.
- Operations and maintenance of facilities:
 - Cost savings and/or performance improvements
 - Resident services: environment (heating), cleaning, laundry facilities, repairs and maintenance, trash removal, emergency help, etc.
 - Improvements in operations of utility services (power, water, cryogenic gases, heating) through cost reduction, performance improvement, innovative solutions (automation, use of computers etc.), use of new materials/technology, new management methods, efficient use of manpower etc.
- Recreational services: availability of equipment and service (customer satisfaction)
- Transportation services; availability, complains, maintenance time, accidents, mishaps due to lack of maintenance/service
- Availability of tools, instruments and other research related services: complains, response time
- Laboratory operations: availability and usefulness of facilities and equipment, provision of consumable materials, presence and availability of support staff, etc.
- Telecommunications services operations (complaints, response time, repeat visits, availability of parts, repeat problems-was it done right the first time?
- Remote camp services: was everything done right, on-time, response time for problems etc.
- Management of IT services (PCs, LAN, WAN, software etc.): maximize availability, provide staff support,
- Provision of communication services – maximize availability, interaction with the provider organization
- Construction activities: materials on-site when required, appropriate staff available, completion of work on schedule and within budget.
- Personnel movement – program participants moved to and from work sites efficiently and on-schedule
- Materials movement: goods and equipment moved to their destination on time and at minimum cost.
- Staff utilization: coordinate staffing plans and over see execution so as to provide adequate support using the smallest number of construction staff consistent with the safety, cost and efficiency considerations.

Program Innovations

- Plans and execution for feedback and suggestions from the residents, employees, subcontractors, visitors, partners etc.
- Laboratory facilities: keeping pace with future trends in university and research lab equipment and techniques.. Investigate and recommend up-coming requirements for the research support effort.
 - Research support instruments and equipment
 - Data collection and analysis tools (IT related or other)
 - Consumables (chemicals, reagents etc.)
- Consolidation of data bases – planning and execution of integrated systems
- Employee training: develop and implement training/cross training system
- Development of innovative management methods (subcontracting, leasing, out-sourcing, service contracts, selection equipment with common and interchangeable parts etc.)
- Use of innovative construction methods/materials for cost (capital and operating) reduction
- Development and execution of plans for industry participation for cost sharing and public relations
- Use of alternate plans for utility cost reduction (different lighting fixtures, heating methods, water recycling, fuel selection, automation, out-sourcing etc.)
- Plans for tourist traffic enhancement and management

- Management practices for cost reduction for the waste generation, recycling and disposal (use of alternate materials for packaging, alternate-packaging methods, on-site waste processing etc.)
- Information services improvement
- Travel arrangements alternate plans for shortening time and reducing expenditures.

C10. PHASE-IN PLAN

[To be added at a later date]

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SECTION D – PACKAGING AND MARKING

D1. GENERAL

Unless otherwise specified, all items shall be packaged and packed in accordance with normal commercial practices. If magnetic media is involved, packaging shall be clearly marked identifying the contents as such and with a warning for protection against exposure to magnetic fields or temperature extremes.

D2. CARGO DESTINE FOR ANTARCTIC LOCATIONS

[Insert here any special packaging instructions regarding shipments to Antarctica -- e.g., Antarctic Conservation Act requirements]

D3. CARGO PACKAGED FOR SHIPPING ON GOVERNMENT AIRCRAFT

[Insert here any special packaging instructions, USAF instructions, USAP hazardous materials handling instructions and other similar documentation for packaging materials for shipment on Government aircraft, including helicopters and other aircraft services provided through NSF contract]

D4. CARGO PACKAGED FOR SHIPPING ON GOVERNMENT SURFACE VESSELS

[Insert here any special packaging instruction, MSC instructions, USGC instructions, hazardous material guidance, and other similar documentation for packaging materials for shipment on Government vessels, or the Palmer and Gould].

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SECTION E – INSPECTION AND ACCEPTANCE

E1. NOTICE LISTING CLAUSES INCORPORATED BY REFERENCE

Federal Acquisition Regulation (48 CFR Chapter 1) Clauses

52.246-5 Inspection of Services -- Cost-Reimbursement APR 1984

52.246-15 Certificate of Conformance APR 1984

E2. EVALUATION AND ACCEPTANCE

Evaluation and acceptance of services delivered under this contract shall be performed by the Contracting Officer or other such person as may be designated elsewhere in this contract or in writing by the Contracting Officer.

E3. CONTRACTOR'S QUALITY ASSURANCE PROGRAM

[Insert text based upon review of 52.246-4, 52.246-15, selected EVM standard and ISO 9001 standard]

E4. STANDARDS FOR ACCEPTANCE

Unless otherwise authorized in writing by the Contracting Officer, all work performed and presented for acceptance shall be free from error.

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SECTION F – DELIVERIES OR PERFORMANCE

F1. PERIOD OF PERFORMANCE WITH OPTION PERIOD

This contract shall commence on October 1, 1999 and shall expire on March 31, 2005. Should the Government elect to exercise its option to extend the term of the contract, the term of the contract shall be extended by sixty (60) months, and shall expire on March 31, 2010.

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT. (MAR 1989)

- (a) The Government may extend the term of this contract by written notice to the Contractor not less than 180 days prior to the contract's expiration.
- (b) If the Government exercises this option, the extended contract shall be considered to include this option provision.
- (c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 126 months.

F2. NOTICE LISTING CLAUSES INCORPORATED BY REFERENCE

Federal Acquisition Regulation (48 CFR Chapter 1) Clauses

52.242-15 Stop-Work Order

AUG 1989

F3. GOVERNMENT FURNISHED PROPERTY

F3.1 Ownership and Control

F3.1.1 The Government will retain full ownership and control of all property furnished by the Government. Government furnished property not consumed in performance shall be surrendered upon demand (i.e., during performance, or end of the period of performance).

F3.1.2 The Contractor shall execute receipt of property documents for any property furnished by the Government.

F3.2 Government Furnished Property\Equipment

Property furnished by the Government for use in the performance of work is identified in Attachment ____.

F4. GOVERNMENT FURNISHED OFFICE SPACE, FURNISHINGS, AND SERVICES

F4.1 The Government will furnish, at no cost to the Contractor, the necessary office space, utilities, telephone service, general purpose office equipment, and office furniture for its personnel assigned to work under this contract at Government locations.

F4.2 The Government will furnish the following transportation services.

F4.2.1 Round trip air transportation for the Contractor's personnel between Christchurch, NZ and all Government sites in Antarctica.

F4.2.2 Transportation for cargo by air and surface vessel between designated worldwide locations and Government sites in Antarctica, and between Government sites in Antarctica as mutually agreed upon in the Program Plan. This includes, but is not limited to the following:

F4.2.2.1 One surface vessel capable of carrying containerized cargo and other freight making port calls in Port Hueneme, CA, Port Lyttleton, NZ, and McMurdo Station, Antarctica.

F4.2.2.2 One surface vessel capable of carrying fuel from its acquisition point to McMurdo Station, Antarctica.

F4.2.3 One ice breaking vessel capable of opening and maintaining a shipping channel to McMurdo Station, Antarctica.

F4.2.4 Light and medium lift helicopter services for transportation of personnel and cargo within the general vicinity of McMurdo Station, Antarctica.

F5. PROGRAM PLAN

F5.1 Work under this contract shall be performed in accordance with a *Program Plan* developed by the Contractor in consultation with NSF. It shall be approved in writing by the Contracting Officer.

F5.2 Each Program Plan shall prepared and submitted in accordance with the Work Breakdown Structure, funding levels, guidelines, and formats specified in accordance with this contract and in writing by NSF. The Contractor shall also provide supporting documentation as required.

F5.3 Program Plan periods are as follows.

F5.3.x	Period No.	Begins	Ends
F5.3.1	Phase-In	October 1, 1999	March 31, 2000
F5.3.2	One	April 1, 2000	September 30, 2000
F5.3.3	Two	October 1, 2000	September 30, 2001
F5.3.4	Three	October 1, 2001	September 30, 2002
F5.3.5	Four	October 1, 2002	September 30, 2003
F5.3.6	Five	October 1, 2003	September 30, 2004
F5.3.7	Six	October 1, 2004	September 30, 2005
F5.3.8	Seven	October 1, 2005	September 30, 2006

F5.3.9	Eight	October 1, 2006	September 30, 2007
F5.3.10	Nine	October 1, 2007	September 30, 2008
F5.3.11	Ten	October 1, 2008	September 30, 2009
F5.3.12	Eleven	October 1, 2009	March 31, 2010

F5.4 The Program Plan shall cover the period identified and shall address, but not be limited to the following topics.

F5.4.1 Programmatic goals;

F5.4.2 Scheduled activities;

F5.4.3 Field activities;

F5.4.4 Staffing and organizational plans;

F5.4.5 Estimated costs; and

F5.4.6 Major planning activities.

F5.5 Program Plan changes proposed by the Contractor shall be described in consecutively number submissions, and submitted to NSF for approval prior to their implementation. NSF approval will be by modification to the approved Program Plan signed by the Contracting Officer.

F5.6 The Contractor, unless otherwise prohibited by the Contracting Officer, may redistribute funds among the approved Work Breakdown Structure at the WBS x.x.x level in an amount not to exceed \$250,000 without NSF approval. Fund redistributions shall be reported in the following quarterly report.

F5.7 NSF reserves the right to unilaterally modify the Program Plan. The Contractor shall be entitled to an equitable adjustment in the contract's estimated cost, fees, schedule and other contract term and conditions as necessary.

F6. REPORTING REQUIREMENTS

F6.1 The following schedule identifies the reports required by this contract. Other reports may be required by the Program Plan. Reporting format shall be developed by the Contractor and approved by NSF.

F6.1.x	Item	No.	Date	Note
F6.1.1	Draft Program Plan for Period One	8	February 1, 2000	
F6.1.2	Final Program Plan for Period One	8	March 15, 2000	
F6.1.3	Draft Program Plan for Period Two	8	June 1, 2000	(1)
F6.1.4	Final Program Plan for Period Two	8	September 15, 2000	(1)
F6.1.5	Quarterly Reports	8	January 20, 2000	(2)
F6.1.6	After Operations Reports	8	October 1, 2000	(1)

Note (1): Annually thereafter

Note (2): Quarterly thereafter

F6.2 Seven copies of the Program Plan and Reports shall be submitted to:

National Science Foundation
Office of Polar Programs
4201 Wilson Boulevard, Room 755
Arlington, VA 22230
ATTN: **[to be determined]**

F6.3 One copy of the Program Plan and Reports shall be submitted to:

National Science Foundation
Division of Contracts, Policy, and Oversight
4201 Wilson Boulevard, Room 475
Arlington, VA 22230
ATTN: Contracting Officer

F7. PROPERTY REPORTING

[To be added at a later date]

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SECTION G – CONTRACT ADMINISTRATION DATA

G1. CONTRACTS

G1.1 One conformed copy of the contract will be furnished to the Contractor.

G1.2 The Contractor shall maintain a copy of the contract and all modifications at its headquarters, and at significant work locations throughout the contract's term.

G1.3 The Contractor shall be responsible for reproduction and distribution of the contract and its modifications.

G2. INVOICE AND BILLING INFORMATION

In order to initiate payment, the Contractor shall submit proper invoices in the manner and format described herein. One original and three copies are required. The following data must be included on an invoice for it to constitute a proper invoice:

- name of contractor and invoice date;
- contract and task order number, or other authorization for delivery of property or services;
- contract line item, description, price, fee (if applicable), and quantity of property and services actually delivered or rendered;
- shipping and payment terms;
- name (where practicable), title, phone number, and complete mailing address of responsible official to whom payment is to be sent; and
- other substantiating documentation or information as required by the contract.

The Contractor may use its own form, but all the above information must be on the invoice. However, it is preferred that vouchers be submitted on the Government Standard Form 1034, "Public Voucher for Purchases and Services Other Than Personal - Continuation Sheet." These forms are available from the Government Printing Office, 710 N. Capitol Street, Washington, DC 20801.

A separate copy of each invoice shall be provided to the Contractor's cognizant Government audit activity.

G3. PAYMENT INFORMATION

Payments of invoices and vouchers shall be subject to the withholding provisions of this contract.

Payments under the contract will be made either by check or by wire transfer through the Treasury Financial Communications System, at the option of the Government.

For payments by check, the Contractor shall furnish to the Contracting Officer within ten (10) days of award the full name (where practicable), title, telephone number, and complete mailing address of responsible official to whom check payments are to be sent.

For wire transfers, the following bank accounting information is required: (1) name of the receiving bank; (2) city and state of the receiving bank; and (3) American Bankers Association (ABA) nine-digit identifier of the receiving bank.

G4. CONTRACTING OFFICER'S AUTHORITY

The Contracting Officer is the only person authorized to approve changes in any of the requirements under this contract. Notwithstanding any clause contained elsewhere in this contract, the said authority remains solely with the Contracting Officer.

In the event the Contractor effects any change at the direction of any person other than the Contracting Officer, including any change beyond the scope of authority given to the duly authorized Contracting Officer's Technical Representative identified in the contract, the change will be considered to have been made without authority and no adjustment will be made in the contract price to cover any increase in charges incurred as a result thereof. The Contracting Officer has the authority to perform any and all postaward functions in administering and enforcing this contract in accordance with its terms and conditions.

G5. COTR DESIGNATION AND AUTHORITY

The Contracting Officer has designated **[to be identified]** as the Contracting Officer's Technical Representative (COTR) under this contract.

The COTR is responsible for administering the performance of work under this contract. IN NO EVENT, however, will any understanding, agreement, modification, change order, or other matter deviating from the terms of this contract be effective or binding upon the Government unless formalized by proper contractual documents executed by the Contracting Officer prior to completion of the contract.

The COTR may give technical direction to the Contractor which fills in details, requires pursuit of certain lines of inquiry, requires replanning of funds in the current Federal fiscal year within the approved Work Breakdown Structure in an amount not to exceed \$1,000,000, or otherwise serves to facilitate the Contractor's compliance with the contract. To be valid, technical direction by the COTR: (1) must be issued in writing consistent with the general scope of work set forth in this contract; (2) may not constitute new assignment of work nor change the expressed terms, conditions or specifications of this contract; and (3) shall not constitute a basis for any increase in the contract estimated cost, or extension to the contract delivery schedule.

G6. NSF WBS MANAGERS DESIGNATION AND AUTHORITY

[to be added at a later date]

G7. AUTHORITY OF OTHER NSF PERSONNEL

[to be added at a later date]

G8. NSF PROPERTY OFFICER DESIGNATION AND AUTHORITY

The Contracting Officer hereby designates **[to be determined]** as the cognizant NSF Property Officer. The Property Officer may issue direction regarding the accountability of Government property (including its disposition). IN NO EVENT, however, will any understanding, agreement, modification, change order, or other matter deviating from the terms of this contract be effective or binding upon the Government unless formalized by proper contractual documents executed by the Contracting Officer prior to completion of the contract.

G9. NOTIFICATION OF CHANGES (ORAL OR WRITTEN)

In the event any Government technical direction is interpreted by the Contractor to fall within the clause of this Contract entitled "Changes", the Contractor shall not implement such direction, but shall notify the Contracting Officer in writing of such interpretation within ten (10) working days after the Contractor's receipt of such direction. Such notice shall include the reasons upon which the Contractor bases its belief that the technical direction falls within the purview of the "Changes" clause; and include the Contractor's best estimate as to the revision of the current estimated cost, fee, performance time, delivery schedules or any other contractual provision that would result from implementing the COTR's technical direction.

If, after reviewing the information presented by the Contractor, the Contracting Officer is of the opinion that such direction is within the purview of the "Changes" clause and considers such change desirable, a unilateral direction will be issued to the Contractor to proceed pursuant to the authority granted under that clause. If a determination is made that such direction is technical direction authorized by this schedule clause, the Contractor will be directed to proceed with the implementation of such technical direction.

In the event a determination is made that it is necessary to avoid a delay in performance of the Contract, the Contracting Officer may direct the Contractor to proceed with the implementation of the technical direction pending receipt of the information to be submitted by the Contractor. Should the Contracting Officer later determine that Change direction is appropriate, the written direction issued hereunder shall constitute the required Change direction.

Failure of the Contractor and the Contracting Officer to agree on whether Government direction is technical direction or a Change within the purview of the "Changes" clause shall be a dispute concerning a question of fact within the meaning of the Clause of the General Provision entitled, "Disputes."

G10. CONTRACTOR'S ON-SITE MANAGER(S)

For work performed at Port Hueneme, CA; Christchurch, NZ; McMurdo Station; Amundsen-Scott South Pole Station; Palmer Station; on board research and other vessels; and at other locations identified by NSF the Contractor shall designate an on-site manager, with full authority to receive instruction and act on the firm's behalf. This authority need not include the authority to bind the firm contractually. However, the individuals shall have knowledge of the duties and responsibilities of the Government personnel identified herein. These individuals may be *working managers*. In addition, unless otherwise authorized by the Government, the Contractor shall designate an alternate on-site manager to function in the place of the on-site manager in his/her absence. The on-site manager or his/her alternate shall be on site at all times when Contractor employees are performing work at the designated sites.

G11. PROPERTY ADMINISTRATION

[to be added at a later date]

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SECTION H – SPECIAL CONTRACT REQUIREMENTS

H1. PERSONNEL SECURITY REQUIREMENTS

If required by NSF, each position under this contract will be assigned a position sensitivity level based upon the criteria in Chapter IX, National Science Foundation (NSF) Personnel Manual No. 14.

The position sensitivity level will be determined by the NSF personnel Security Officer.

For each position classified as sensitive, the Contractor shall be provided appropriate security investigation forms by the NSF Personnel Security Officer and shall be responsible for furnishing them to the employee occupying, or proposed to occupy, the position under this contract. The employee must complete the forms and deliver them in person within seven (7) days from the date the forms are furnished to the Contractor to:

National Science Foundation
Head, Personnel Processing Services Center
Division of Human Resource Management
Room 315
4201 Wilson Boulevard
Arlington, VA 22230

Failure to return the completed security investigation forms in person within seven (7) working days shall be cause for making a determination that the employee may not perform, or continue to perform in the case of contracts in effect at the date of issuance of this requirement, in any sensitive capacity under the contract, whether on-site or off-site. The employee may be eligible for reinstatement to the contract if the completed forms are submitted after the seven day period, at the discretion of the NSF Personnel Security Officer.

Cost for conducting the required personnel investigation will be paid by NSF. Investigations will be conducted in accordance with Office of Personnel Management minimum investigative requirements.

If an investigation report contains information which is deemed significant or derogatory, a determination will be made with regard to the Employee's eligibility to serve in the subject position by the NSF Personnel Security Officer, pending adjudication or other disposition of the case.

The Contractor is required to insert terms that conform substantially to the language of this clause, including this paragraph, in all subcontracts under this contract.

H2. KEY PERSONNEL

The personnel specified below are considered to be essential to the performance of work. Prior to diverting any of the specified individuals to other programs, the Contractor shall notify the Contracting Officer reasonable in advance and submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact of such substitution upon the program. No diversion shall be made by the Contractor without the written consent of the Contracting Officer.

Title	Individual	Percent of Labor Effort
[to be negotiated]		

H3. REPLACEMENT OF PERSONNEL – CONTRACTOR PERSONNEL CONDUCT

H3.1 The Contractor shall be responsible for the furnishing of personnel fully qualified to perform the services as provided for in this contract. As a designated representative of the Contractor, Contractor personnel are expected to perform and act in a professional manner at all times. The Contractor shall be fully responsible for the actions of Contractor employees during this contract's period of performance.

H3.2 Performance of contract services will involve work and/or residence on Government and other national Antarctic program facilities. Contractor employees are expected to follow the rules of conduct established by the manager of such facilities that apply to all (both Government and non-Government) personnel working or residing on such facilities.

H3.3 The Contractor's employees are an integral element of this project. As a team member, cooperation, within the scope of this contract, is essential to successful completion of work. Personnel who perform ineffectively, refuse to cooperate in the fulfillment of the project objectives, are unable or unwilling to adapt to living conditions, or whose general performance is unsatisfactory or otherwise disruptive, shall be replaced by the Contractor.

H3.4 If notified by the Contracting Officer of unsatisfactory performance by Contractor personnel an opportunity for corrective action may be afforded. When directed by the Contracting Officer, the Contractor agrees to replace unacceptable personnel within a mutually agreeable time period.

H4. CLEARANCE AND CONSTRAINTS

Notwithstanding any other provision of this contract, at any point in the conduct of this project where NSF approval is required, NSF will endeavor to notify the contractor within ten (10) working days of receipt of a contractor's request as to its approval or disapproval. Failure of NSF to respond within the ten working days shall NOT constitute approval.

H5. LIMITED USE OF DATA AND INFORMATION

Performance of this contract may require the Contractor to access data and information proprietary to a Government agency or Government Contractor and/or such a nature that its dissemination or use, other than in performance of this contract, would be adverse to the interest of the government and/or others.

Contractor and/or Contractor personnel shall not divulge or release data or information developed or obtained in performance of this contract, until made public by the Government, except to authorized Government personnel or upon written approval of the NSF Contracting Officer. The Contractor shall not use, disclose or reproduce proprietary data which bears a restrictive legend, other than as required in the performance of this contract. Nothing herein shall preclude the use of any data independently acquired by the Contractor without such limitations or prohibit an agreement at no cost to the Government between the Contractor and the data owner which provides for greater rights to the Contractor.

H6. TRANSITION

The Contractor may be replaced by a successor Contractor for the performance of requirements of a similar nature and scope as the requirements specified herein. The Contractor shall cooperate to effect an orderly and efficient transition to any such successor Contractor during a transition period to be specified by the Contracting Officer.

H7. WAGE DETERMINATION

Work performed under this contract within the United States may be subject to the Service Contract Act of 1965. The Contracting Officer has not obtained any wage determinations for any places or areas of performance; however will do so upon request.

H8. YEAR 2000 WARRANTY

H8.1 The Contractor warrants that each hardware, software, and firmware product delivered under this contract and listed below shall be able to accurately process date data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, including leap year calculations, when used in accordance with the product documentation provided by the Contractor, provided that all listed or unlisted products (e.g. hardware, software, firmware) used in combination with such listed product properly exchange date data with it. If the contract requires that specific listed products must perform as a system in accordance with the foregoing warranty, then that warranty shall apply to those listed products as a system. The duration of this warranty and the remedies available to the Government for breach of this warranty shall be defined in, and subject to, the terms and limitations of the contractor's standard commercial warranty or warranties contained in this contract, provided that notwithstanding any provision to the contrary in such commercial warranties, the remedies available to the Government shall include repair or replacement of any listed product whose non-compliance is discovered and made known to the contractor in writing within ninety (90) days after acceptance. Nothing in this warranty shall be construed to limit any rights or remedies the Government may otherwise have under this contract with respect to defects other than Year 2000 performance.

H8.2 Actual products to be delivered and subject to this requirement shall be identified in the Program Plan.

H8.3 Any existing NSF systems affected by or to be used in conjunction with products to be delivered and subject to this requirement shall be identified in the Program Plan.

H9. SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN

The Contractor shall establish and maintain a Subcontracting Plan in accordance with the Small Business and Small and Disadvantaged Business Concerns Subcontracting Plan which is attached and made a material part of this contract. Standard Form 294 and Standard Form 295 shall be submitted to the Contracting Officer as instructed therein.

H10. NORMAL WORKING HOURS

Unless otherwise required by the terms and conditions of this contract, or authorized in writing by appropriate NSF personnel the Contractor shall perform all work at the following locations during normal working hours; defined as follows:

[Insert text describing normal working hours at appropriate locations]

H11. HOLIDAYS AND LEAVE

General administrative or holiday leave (as observed locally) may be granted by the NSF Director, by the Office of Personnel Management, by the Senior U.S. Representative in Antarctica, or other U.S. Government authority due to inclement weather or other compelling reason. At the direction of the granting authority any such leave will also apply to Contractor personnel assigned to a Government site.

H12. MEDICAL AND DENTAL QUALIFICATION OF CONTRACTOR PERSONNEL

In addition to any other medical or dental requirements established by this contract, deployment of any of the Contractor's personnel to Antarctica is contingent upon qualification in accordance with (identify medical std and/or manual). The Contractor is responsible for qualification of its own personnel.

(Insert text about medical waiver procedure here).

(Insert text about periodic NSF review of records for oversight purposes here).

H13. INSURANCE REQUIREMENTS

- (a) (1) Except as provided in subparagraph (2) immediately following, or in paragraph (h) of this clause (if the clause has a paragraph (h)), the Contractor shall provide and maintain workers' compensation, employer's liability, comprehensive general liability (bodily injury), comprehensive automobile liability (bodily injury and property damage) insurance, and such other insurance as the Contracting Officer may require under this contract.
- (2) The Contractor may, with the approval of the Contracting Officer, maintain a self-insurance program; provided that, with respect to workers' compensation, the Contractor is qualified pursuant to statutory authority.
- (3) All insurance required by this paragraph shall be set forth in the provisions of this contract and be in a form and amount and for those periods as the Contracting Officer may require or approve and with insurers approved by the Contracting Officer.
- (b) The Contractor agrees to submit for the Contracting Officer's approval, to the extent and in the manner required by the Contracting Officer, any other insurance that is maintained by the Contractor in connection with the performance of this contract and for which the Contractor seeks reimbursement.
- (c) Except as provided in paragraph (h) of this clause (if the clause has a paragraph (h)), the Contractor shall be reimbursed
 - (1) For that portion (i) of the reasonable cost of insurance allocable to this contract and (ii) required or approved under this clause; and
 - (2) For certain liabilities (and expenses incidental to such liabilities) to third persons not compensated by insurance or otherwise. These liabilities must arise out of the performance of this contract, whether or not caused by the negligence of the Contractor or of the Contractor's agents, servants, or employees, and must be represented by final judgments or settlements approved in writing by the Government. These liabilities are for

- (i) Loss of or damage to property (other than property owned, occupied, or used by the Contractor, rented to the Contractor, or in the care, custody, or control of the Contractor; or
 - (ii) Death or bodily injury.
- (d) The Government's liability under paragraph (c) of this clause is subject to the "Limitation of Cost" or the "Limitation of Funds" clause of this contract.
- (e) The Contractor shall not be reimbursed for liabilities (and expenses incidental to such liabilities)
 - (1) For which the Contractor is otherwise responsible under the express terms of any clause specified in the Schedule or elsewhere in the contract:
 - (2) For which the Contractor has failed to insure or to maintain insurance as required by the Contracting Officer; or
 - (3) That result from willful misconduct or lack of good faith on the part of any of the Contractor's directors, officers, managers, superintendents, or other representatives who have supervision or direction of
 - (i) All or substantially all of the Contractor's business;
 - (ii) All or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed; or
 - (iii)
- (f) The provisions of paragraph (e) of this clause shall not restrict the right of the Contractor to be reimbursed for the cost of insurance maintained by the Contractor in connection with the performance of this contract, other than insurance required in accordance with this clause; provided, that such cost is allowable under the Allowable Cost and Payment clause of this contract.
- (g) If any suit or action is filed or any claim is made against the Contractor, the cost and expense of which may be reimbursable to the Contractor under this contract, and the risk of which is then uninsured or is insured for less than the amount claimed, the Contractor shall
 - (1) Immediately notify the Contracting Officer and promptly furnish copies of all pertinent papers received.
 - (2) Authorize Government representatives to collaborate with counsel for the insurance carrier in settling or defending the claim when the amount of the liability claimed exceeds the amount of coverage; and
 - (3) Authorize Government representatives to settle or defend the claim and to represent the Contractor in or to take charge of any litigation, if required by the Government, when the liability is not insured or covered by bond. The Contractor may, at its own expense, be associated with the Government representatives in any such claim or litigation.
- (h) The Contractor warrants that insurance coverage (currently in force) exists in the following areas and in amounts not less than those specified below:

Type <u>Insurance</u>	<u>Per Person</u>	<u>Property</u>	Coverage <u>Per Accident</u>
I. Comprehensive General Liability	\$500,000	\$500,000	\$1,500,000

2. Automobile \$500,000 \$500,000 \$1,000,000

3. A supplemental umbrella policy for \$5,000,000.

4. Workman's Compensation - As required by law at the job site.

The Comprehensive general and automobile liability policies shall contain a provision worded as follows:

"The insurance company waives any right of subrogation against the United States of America which may arise by reason of any payment under the policy."

The contractor shall file with the Contracting Officer prior to beginning performance under this contract, a certificate of insurance evidencing the above coverage.

The Contractor shall provide to the Contracting Officer within five (5) days after occurrence, notice of cancellation of or reductions below the above cited amounts of any insurance coverage related to this requirement.

The Contractor warrants that such insurance coverage for all subcontractors who will work at any of the sites of performance does or will exist before subcontractors begin performance.

H14. LIMITATION ON CONTRACTOR DESIGN-BUILD ACTIVITIES

Unless otherwise authorized by the Contracting Officer, the Contractor shall not perform design-build work on any single construction project with an estimated cost of \$500,000 or greater.

H15. AWARD FEE EVALUATION CRITERIA

[to be added at a later date]

H16. AWARD OF CONTRACT TO U.S. FIRMS AND CITIZENS ONLY

[under consideration by NSF]

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SECTION I – CONTRACT CLAUSES

II. FAR CLAUSES INCORPORATED BY REFERENCE

52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

NOTICE LISTING CLAUSES INCORPORATED BY REFERENCE

Federal Acquisition Regulation (48 CFR Chapter 1) Clauses

52.202-1	DEFINITIONS	OCT 1995
52.203-3	GRATUITIES	APR 1984
52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT	JUL 1995
52.203-7	ANTI-KICKBACK PROCEDURES	JUL 1995
52.203-8	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	JAN 1990
52.204-4	PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER	JUN 1996
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	JUL 1995
52.211-5	NEW MATERIAL	MAY 1995
52.211-7	OTHER THAN NEW MATERIAL, RESIDUAL INVENTORY, AND FORMER GOVERNMENT SURPLUS PROPERTY	MAY 1995
52.215-2	AUDIT AND RECORDS--NEGOTIATION - ALTERNATE I (JAN 1997)	AUG 1996
52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	OCT 1995
52.215-23	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA --MODIFICATIONS	OCT 1995

52.215-24	SUBCONTRACTOR COST OR PRICING DATA	OCT 1995
52.215-25	SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS	OCT 1995
52.215-27	TERMINATION OF DEFINED BENEFIT PENSION PLANS	MAR 1996
52.215-33	ORDER OF PRECEDENCE	JAN 1986
52.215-39	REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS (PRB)	MAR 1996
52.215-40	NOTIFICATION OF OWNERSHIP CHANGES	FEB 1995
52.215-42	REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA -- MODIFICATIONS	JAN 1997
52.216-7	ALLOWABLE COST AND PAYMENT	MAR 1997
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS	OCT 1995
52.219-9	SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN - ALTERNATE II (MAR 1996)	AUG 1996
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES	FEB 1997
52.222-3	CONVICT LABOR	AUG 1996
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS	JUL 1995
52.222-26	EQUAL OPPORTUNITY	APR 1984
52.222-28	EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS	APR 1984
52.222-35	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS	APR 1984
52.222-36	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS	APR 1984
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS EMPLOYMENT AND VETERANS OF THE VIETNAM ERA	JAN 1988
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED	MAY 1989
52.222-43	FAIR LABOR STANDARDS ACT AND SERVICE CONTRACT ACT -- PRICE ADJUSTMENT (MULTIPLE YEAR AND OPTION CONTRACTS)	MAY 1989
52.223-2	CLEAN AIR AND WATER	APR 1984
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL	JAN 1997

	SAFETY DATA - ALTERNATE I (JUL 1995)	
52.223-5	POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION	MAR 1997
52.223-6	DRUG-FREE WORKPLACE	JAN 1997
52.223-12	REFRIGERATION EQUIPMENT AND AIR CONDITIONERS	MAY 1995
52.223-14	TOXIC CHEMICAL RELEASE REPORTING	OCT 1996
52.224-1	PRIVACY ACT NOTIFICATION	APR 1984
52.224-2	PRIVACY ACT	APR 1984
52.225-11	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	OCT 1996
52.227-1	AUTHORIZATION AND CONSENT	JUL 1995
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT	AUG 1996
52.230-2	COST ACCOUNTING STANDARDS	APR 1996
52.230-3	DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES	APR 1996
52.230-4	CONSISTENCY IN COST ACCOUNTING PRACTICES	AUG 1992
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS	APR 1996
52.232-9	LIMITATION ON WITHHOLDING OF PAYMENTS	APR 1984
52.232-17	INTEREST	JUN 1996
52.232-22	LIMITATION OF FUNDS	APR 1984
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986
52.232-25	PROMPT PAYMENT	MAY 1997
52.233-1	DISPUTES - ALTERNATE I (DEC 1991)	OCT 1995
52.233-3	PROTEST AFTER AWARD - ALTERNATE I (JUN 1985)	AUG 1996
52.237-2	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION	APR 1984
52.237-7	INDEMNIFICATION AND MEDICAL LIABILITY INSURANCE	JAN 1997
52.237-8	RESTRICTION ON SEVERENCE PAYMENTS TO FOREIGN NATIONALS	OCT 1995

52.239-1	PRIVACY OR SECURITY SAFEGUARDS	AUG 1996
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS	APR 1984
52.242-3	PENALTIES FOR UNALLOWABLE COSTS	OCT 1995
52.242-4	CERTIFICATION OF FINAL INDIRECT COSTS	JAN 1997
52.242-13	BANKRUPTCY	JUL 1995
52.243-2	CHANGES--COST REIMBURSEMENT - ALTERNATE II (APR 1984)	AUG 1987
52.244-2	SUBCONTRACTS (COST REIMBURSEMENT AND LETTER CONTRACTS)	FEB 1997
52.244-5	COMPETITION IN SUBCONTRACTING	DEC 1996
52.245-1	PROPERTY RECORDS	APR 1984
52.245-19	GOVERNMENT PROPERTY FURNISHED "AS IS."	APR 1984
52.247-63	PREFERENCE FOR U.S.-FLAG AIR CARRIERS	APR 1984
52.247-64	PREFERENCE FOR PRIVATELY-OWNED U.S.-FLAGGED COMMERCIAL VESSELS	AUG 1996
52.249-6	TERMINATION (COST-REIMBURSEMENT)	SEP 1996
52.251-1	GOVERNMENT SUPPLY SOURCES - ALTERNATE I	APR 1984
52.253-1	COMPUTER GENERATED FORMS	JAN 1991

12. FAR CLAUSES INCORPORATED IN FULL TEXT

[to be added at a later date]

13. DFAR CLAUSES INCORPORATED BY REFERENCE

(The National Science Foundation is reviewing various *earned value management* system implementations. These include requirements as defined by the Department of Defense, Department of Energy, NASA, Defence Australia, the British Standards Institute and the Canadian Government. Comments on their application are welcome.)

14. NSFAR CLAUSES INCORPORATED IN FULL TEXT

Rights in Data (APR 84)

(a) Subject Data

(i) The term "Subject Data" as used herein includes writings, information stored in any form, sound recordings, computer programs, pictorial reproductions, drawings, or other graphic representations and works of any similar nature which are first generated, produced or composed in the performance of this contract, whether delivered or not under this contract.

(ii) All Subject Data shall be the sole property of the Foundation. The Contractor shall not publish, reproduce, distribute or otherwise make disposition of such Subject Data in whole or in part or in any manner or form, or authorize others to do so without the prior written consent of the Contracting Officer or until such time as the Government may have released such Subject Data to the public.

(b) Other Data

(i) The term "Other Data" as defined herein includes writings, information stored in any form, sound recordings, computer programs, pictorial reproductions, drawings, or other graphic representations and works of any similar nature, not generated, produced, or composed for the first time in the performance of this contract, whether or not copyrighted, which are delivered under this contract.

(ii) The Government may duplicate, use and disclose in any manner and for any purpose whatsoever, and have others so do, all or any part of the Other Data delivered by the Contractor to the Government under this contract except as provided by subparagraph (b)(ii)(A) below.

(A) Material Covered by Copyright. The Contractor agrees to and does hereby grant to the Government, and to its officers, agents, and employees acting within the scope of their official duties, a royalty -free, non-exclusive and irrevocable license, throughout the world for Government purposes to publish, translate, reproduce, deliver, perform, dispose of, and to authorize others to do so, all Other Data now or hereafter covered by copyright. No such copyrighted matter shall be included in Other Data furnished hereunder without the written permission of the copyright owner for the Government to use such copyrighted matter in the manner described in this subparagraph (b)(ii)(A).

(c) The terms "Subject Data" and "Other Data" as defined herein do not include financial reports, cost analyses and similar information incidental to contract administration.

(d) The Contractor shall report to the Government promptly and in reasonable written detail each notice or claim of copyright infringement received by the Contractor with respect to any technical data delivered hereunder.

(End of Clause)

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SECTION J – LIST OF ATTACHMENTS

J1. LISTING OF ATTACHMENTS

[None included at this time]

[balance of page intentionally left blank]

SECTION K – REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS

K1. OFFEROR REPRESENTATION AND CERTIFICATION

By signature in Block 17 of Standard Form 33 (which is the face page of this solicitation), the offeror certifies that (i) all Representations and Certifications contained in the solicitation and offer are complete, current and accurate as required, (ii) the offeror is aware that award of any contract to the offeror shall be considered to have incorporated the applicable Representations and Certifications by reference in accordance with FAR 14.201-1(c) or 15.406-1(b), and (iii) the offeror is aware of the penalty prescribed in 18 U.S.C. 1001 for making false statements in proposals.

The Representations and Certifications contained in this section should be carefully reviewed, filled in as appropriate, and included in offers as required under Section L.

K2. FAR PROVISIONS INCORPORATED BY REFERENCE

52.203-11	CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	APR 1991
52.222-21	CERTIFICATION OF NONSEGREGATED FACILITIES	APR 1991
52.223-05	CERTIFICATION REGARDING A DRUG-FREE WORKPLACE	JUL 1995

K3. FAR PROVISIONS INCORPORATED IN FULL TEXT

52.203-02 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that:

(1) The prices in this offer have been arrived at independently without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered.

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law.

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory:

(1) Is the person in the offeror's organization responsible for determining the prices being offered in the bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(2) (i) Has been authorized, in writing, to act as an agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1)

through (a)(3) of this provision _____ *[insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization]*

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

52.203-4 CONTINGENT FEE REPRESENTATION AND AGREEMENT (APR 1984)

(a) *Representation.* The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror:

[Note: The offeror must check the appropriate boxes. For interpretation of the representation, including the term "bona fide employee," see Subpart 3.4 of the Federal Acquisition Regulation (FAR).]

(1) ☐ Has, ☐ has not employed or retained any person or company to solicit or obtain this contract.

(2) ☐ Has, ☐ has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) *Agreement.* The offeror agrees to provide information relating to the above Representation as requested by the CO and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the CO:

(1) A completed Standard Form 119, *Statement of Contingent or Other Fees*, (SF 119).

(2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number, and representing that the prior SF 119 applies to this offer or quotation.

52.204-03 TAXPAYER IDENTIFICATION (MAR 1994)

(a) *Definitions.*

"Common parent," as used in this solicitation provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Corporate status," as used in this solicitation provision means a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)," as used in this solicitation provision, means the number required by the IRS to be used by the offeror in reporting income tax and other returns.

(b) All offerors are required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 United States Code (U.S.C.) 6041, 6041A, and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting

contract is subject to reporting requirements described in FAR 4.903, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) *Taxpayer Identification Number (TIN).*

☐ TIN: _____

☐ TIN has been applied for

☐ TIN is not required because:

☐ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the U.S. and does not have an office or place of business or a fiscal paying agent in the U.S.

☐ Offeror is an agency or instrumentality of a foreign Government

☐ Offeror is an agency or instrumentality of a Federal, state, or local Government

☐ Other. State basis _____

(d) *Corporate Status.*

☐ Corporation providing medical and health care services, or engaged in the billing and collecting of payments for such services

☐ Other corporate entity

☐ Not a corporate entity

☐ Sole proprietorship

☐ Partnership

☐ Hospital or extended care facility described in 26 Code of Federal Regulations (CFR) 501(c)(3) that is exempt from taxation under 26 Code of Federal Regulations (CFR) 501(a)

(e) *Common Parent.*

☐ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this clause.

☐ Name and TIN of common parent:
Name _____
TIN _____

52.204-05 WOMEN-OWNED BUSINESS (OCT 1995)

Representation. The offeror represents that it ☐ is, ☐ is not a women-owned business concern.

Definition. "Women-owned business concern," as used in this provision means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

52.209-05 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT,
AND OTHER RESPONSIBILITY MATTERS (MAR 1996)

- (a) (1) The offeror certifies, to the best of its knowledge and belief, that:
- (i) The offeror and/or any of its principals:
- (A) Are ☐ are not ☐ presently debarred, suspended, proposed for debarment or declared ineligible for the award of contract by any Federal agency.
- (B) Have ☐ have not ☐, within a 3-year period preceding this offer, been convicted of, or had a civil judgment rendered against them for: commission of a fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property.
- (C) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a Governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.
- (ii) The offeror has ☐ has not ☐, within a 3-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.
- (2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).
THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, U.S.C.
- (b) The offeror shall provide immediate written notice to the CO if, at any time prior to contract award, the offeror learns that its certification was erroneous when submitted or has become erroneous by reason of change of circumstances.
- (c) A certification that any of the items in paragraph (a) of this provision exist will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the offeror's responsibility. Failure of the offeror to furnish a certification or provide such additional information as requested by the CO may render the offeror non responsible.
- (d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the CO may terminate the contract resulting from this solicitation for default.

52.215-06 TYPE OF BUSINESS ORGANIZATION (JUL 1987)

The offeror or quoter, by checking the applicable box, represents that:

- (a) It operates as ☐ a corporation incorporated under the laws of the State of _____, ☐ an individual, ☐ a partnership, ☐ a nonprofit organization, or ☐ a joint venture.

(B) If the offeror or quoter is a foreign entity, it operates as ☐ an individual, ☐ a partnership, ☐ a nonprofit organization, ☐ a joint venture, or ☐ a corporation, registered for business in _____(country).

52.215-1 AUTHORIZED NEGOTIATORS (APR 1984)

The offeror or quoter represents that the following persons are authorized to negotiated on its behalf with the Government in connection with this request for proposals or quotations: *[list names, titles, and telephone numbers of the authorized negotiators]*.

_____	_____	_____
_____	_____	_____
_____	_____	_____

52.215-20 PLACE OF PERFORMANCE (APR 1984)

(a) The offeror or quoter, in the performance of any contract resulting from this solicitation, ☐ intends, ☐ does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or quoter as indicated in the proposal or quotation.

(b) If the offeror or quoter checks "intends" in paragraph (a) above, it shall insert in the spaces provided below the required information:

Place of Performance	Name and Address of Owner and Operator of the Plant (Street, Address, City, County, State, Zip Code) Facility if Other than Offeror or Quoter
_____	_____
_____	_____
_____	_____

52.219-01 SMALL BUSINESS PROGRAM REPRESENTATION (JAN 1997)

(a) (1) The Standard Industrial Classification Code for this acquisition is _____.

(2) The small business size standard is _____.

(3) The small business size standard for a concern which submits an offer in its own name, other than on construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) *Representations*

(1) The offeror represents and certifies as part of its offer that it ☐ is, ☐ is not a small business concern.

(2) (Complete only if offeror represented itself as a small business concern in block (b)(1) of this section.) The offeror represents as part of its offer that it ☐ is, ☐ is not a small disadvantaged business concern.

(3) (Complete only if offeror represented itself as a small business concern in block (b)(1) of this section.) The offeror represents as part of its offer that it ☐ is, ☐ is not a women-owned small business concern.

Definitions.

"Joint venture," for purposes of a small disadvantaged business (SDB) set-aside or price evaluation preference (as prescribed at 13 CFR 124.321), is a concern that is owned and controlled by one or more socially and economically disadvantaged individuals entering into a joint venture agreement with one or more business

concerns and is considered to be affiliated for size purposes with such other concern(s). The combined annual receipts or employees of the concerns entering into the joint venture must meet the applicable size standard corresponding to the Standard Industrial Classification Code designated for the contract. The majority of the venture's earnings must accrue directly to the socially and economically disadvantaged individuals in the SDB concern(s) in the joint venture. The percentage of the ownership involvement in a joint venture by disadvantaged individuals must be at least 51 percent.

“Small business concern,” as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Par 121 and the size standard in paragraph (a) of this provision.

“Small disadvantaged business concern,” as used in this provision, means a small business concern that (1) is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals, and (2) has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more of these entities, which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirements of 13 CFR Part 124.

“Women-owned small business concern,” as used in this provision, means a small business concern:

(1) Which is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women.

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice*

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small or small disadvantaged business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a) 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall:

(i) Be punished by imposition of fine, imprisonment, or both

(ii) Be subject to administrative remedies, including suspension and debarment

(iii) Be ineligible for participation in programs conducted under the authority of the Act

52.222-22 PREVIOUS CONTRACT AND COMPLIANCE REPORTS (APR 1984)

The offeror represents that:

(a) It ☐ has, ☐ has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order. 11114

(b) It ☐ has, ☐ has not, filed all required compliance reports

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards

52.222-25 AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that:

It ☐ has developed and has on file, ☐ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2)

It ☐ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor

52.223-01 CLEAN AIR AND WATER CERTIFICATION (APR 1984)

The offeror certifies that:

(a) Any facility to be used in the performance of this proposed contract is ☐, is not ☐ listed on the Environmental Protection Agency (EPA) List of Violating Facilities

(b) The offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the EPA, indicating that any facility that the offeror proposed to use for the performance of the contract is under consideration to be listed on the EPA list of Violating Facilities

(c) The offeror will include a certification substantially the same as this certification including this paragraph (c) in every nonexempt subcontract

52.227-06 ROYALTY INFORMATION (APR 1984)

(a) *Cost or charges for royalties.* When the response to the solicitation contains costs or charges for royalties totaling more than \$250, the following information shall be included in the response relating to each separate item of royalty or license fee:

(1) Name and address of licensor.

(2) Date of license agreement.

(3) Patent numbers, patent applications serial numbers, or other basis on which the royalty is payable.

(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.

(5) Percentage or dollar rate of royalty per unit.

(6) Unit price of contract item.

(7) Number of units.

(8) Total dollar amount of royalties.

(b) *Copies of current licenses.* In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims or specific patents.

52.230-01 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (APR 1996)

[Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by roman numerals I through III.]

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT—COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of \$500,000 resulting from this solicitation, except contracts in which the price negotiated is based on (1) established catalog or market prices of commercial items sold in substantial quantities to the general public, or (2) prices set by law or regulation, will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR, 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) Part I of this Provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

(1) ☐ Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) Original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal Official), as applicable, and (ii) One copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CAS B DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal Official and/or from the loose-leaf version of the FAR.)

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official where filed:

The offeror further certifies that practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

- (2) ☐ Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official where filed:

The offeror further certifies that the practice s used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable disclosure statement.

- (3) ☐ Certificate of Monetary Exemption.

The offeror, hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than \$25 million (of which at least one award exceeded \$1 million) in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the CO immediately.

- (4) ☐ Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR, 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS -covered prime contract or subcontract of \$25 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS—ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the CAS clause.

☐ The offeror hereby claims an exemption from the CAS clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than \$25 million in awards of CAS-covered prime contracts and subcontracts, or the offeror did not receive a single CAS-covered award exceeding \$1 million. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the CO immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of \$25 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of \$25 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the CAS clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

☐ YES ☐ NO

SECTION L – INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

L1. FAR PROVISIONS INCORPORATED BY REFERENCE

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (JUN 1988)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

NOTICE LISTING SOLICITATION PROVISIONS INCORPORATED BY REFERENCE

Federal Acquisition Regulation (48 CFR Chapter 1) Provisions

52.215-5	SOLICITATION DEFINITIONS	JUL 1987
52.215-7	UNNECESSARILY ELABORATE PROPOSALS OR QUOTATIONS	APR 1984
52.215-8	AMENDMENTS TO SOLICITATIONS	DEC 1989
52.215-9	SUBMISSION OF OFFERS	DEC 1989
52.215-10	LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWAL OF PROPOSALS	MAY 1997
52.215-12	RESTRICTION ON DISCLOSURE AND USE OF DATA	APR 1984
52.215-13	PREPARATION OF OFFERS	APR 1984
52.215-14	EXPLANATION TO PROSPECTIVE OFFERORS	APR 1984
52.215-15	FAILURE TO SUBMIT OFFER	APR 1984
52.215-16	CONTRACT AWARD	JUL 1990
52.222-46	EVALUATION OF COMPENSATION FOR PROFESSIONAL EMPLOYEES	FEB 1993
52.237-1	SITE VISIT	APR 1984

L2. FAR PROVISIONS INCORPORATED IN FULL TEXT

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a cost-plus-award-fee type contract resulting from this solicitation.

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Mr.

William C. Bruning; Contracting Officer; National Science Foundation; Division of Contracts, Policy, and Oversight; 4201 Wilson Boulevard, Room 475; Arlington, VA 22230.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L3. PAYMENT OF BID/PROPOSAL COSTS

This solicitation does not commit the Government to pay any cost incurred in the submission of the offer/quotation or in making necessary studies or designs for the preparation thereof, nor to contract for services of supplies.

L4. COMMITMENT OF GOVERNMENT TO AWARD A CONTRACT

This solicitation does not commit the Government to award a contract. The Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with the proposed procurement.

L5. PROPOSAL ACCURACY

Proposals must set forth full, accurate and complete information as required by the request for proposal (including attachments). There is a criminal penalty for making false statements at 18 U.S.C. 1001.

L6. ORGANIZATIONAL CONFLICTS-OF-INTEREST

NSF has employed the services of Permanent Solutions Industries, Inc. of Falls Church, VA and their subcontractor Capital Strategic Advisory Services of Rockville, MD under NSF Contract No. OPP-9805698 in preparing this solicitation. Accordingly, these companies and some of their employees (past, present and future) have potential conflicts-of-interest if engaged by a prospective offeror in any type of business or employment relationship. Firms interested in participating in this solicitation are encouraged to contact NSF for further information prior to engaging the services of these firms or their employees.

52.209-07 ORGANIZATIONAL CONFLICTS OF INTEREST CERTIFICATE — MARKETING CONSULTANTS (OCT 1995)

(a) Definitions.

(1) “Marketing consultant” means any independent contractor who furnishes advice, information, direction, or assistance to an offeror or any other contractor in support of the preparation or submission of an offer for a Government contract by that offeror. An independent contractor is not a marketing consultant when rendering:

(i) Services excluded in Subpart 37.2

(ii) Routine engineering and technical services (such as installation, operation, or maintenance of systems, equipment, software, components, or facilities)

(iii) Routine legal, actuarial, auditing, and accounting services

(iv) Training services

(2) Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the Government, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.

(b) An individual or firm that employs, retains, or engages contractually one or more marketing consultants in connection with a contract, shall submit to the contracting officer, with respect to each marketing consultant, the certificates described below, if the individual or firm is notified that it is the apparent successful offeror.

(c) The certificate must contain the following:

(1) The name of the agency and the number of the solicitation in question.

(2) The name, address, telephone number, and Federal taxpayer identification number of the marketing consultant.

(3) The name, address, and telephone number of a responsible officer or employee of the marketing consultant who has personal knowledge of the marketing consultants involvement in the contract.

(4) A description of the nature of the services rendered by or to be rendered by the marketing consultant.

(5) The name, address, and telephone number of the client or clients, and the name of a responsible officer or employee of the marketing consultant who is knowledgeable about the services provided to such client(s), and a description of the nature of the services rendered to such client(s), if, based on information provided to the contractor by the marketing consultant, any marketing consultant is rendering or, in the 12* months preceding the date of the certificate, has rendered services respecting the same subject matter of the instant solicitation, or directly relating to such subject matter, to the Government or any other client (including any foreign Government or person).

(6) A statement that the person who signs the certificate for the prime contractor has informed the marketing consultant of the existence of Subpart 9.5 and Office of Federal Procurement Policy Letter 89-1.

(7) The signature, name, title, employer's name, address, and telephone number of the persons who signed the certificates for both the apparent successful offeror and the marketing consultant.

(d) In addition, the apparent successful offeror shall forward to the Contracting Officer a certificate signed by the marketing consultant that the marketing consultant has been told of the existence of subpart 9.5 and Office of Federal Procurement Policy Letter 89-1, and the marketing consultant has made inquiry, and to the best of the consultant's knowledge and belief, the consultant has provided no unfair competitive advantage to the prime contractor with respect to the services rendered or to be rendered in connection with the solicitation, or that any unfair competitive advantage that, to the best of the consultant's knowledge and belief, does or may exist, has been disclosed to the offeror.

Failure of the offeror to provide the certifications may result in the offeror being determined ineligible for award. Misrepresentation of any fact may result in the assessment of penalties associated with false certifications or such other provisions provided for by law or regulation.

L7. PROPOSAL PREPARATION INSTRUCTIONS

[To be added at a later date]

L8. PROPOSAL PREPARATION INFORMATION

(NSF is compiling workload statistics, operating manuals and standard operating procedures, and will make them available with the solicitation in final form. Attached is the list of workload statistics NSF is compiling. Organizations are encouraged to identify and submit their suggestions for additional workload statistics or any other information that may be useful in preparing offers to NSF for compilation.)

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SECTION M – EVALUATION FACTORS FOR AWARD

M1. OVERALL BASIS FOR AWARD

The Government will select the offer for contract award which provides the greatest value to the Government. The combined technical factors are more important than the cost/price factor. The Offerors' past performance on similar contracts will be evaluated to assess the performance risk involved in contracting with a particular organization. Other factors are an important consideration of the Source Selection Official in making the final selection. The Government reserves the right to make tradeoffs between technical and cost considerations that are in the best interest and to the advantage of the Government. Each initial offer should contain the offeror's best terms from a cost or price and technical standpoint.

M2. EVALUATION OF PROPOSALS

M2.1 Technical Evaluation

Proposals received in response to this solicitation will be reviewed and evaluated by a technical proposal evaluation committee. The technical evaluation will be conducted for the purpose of determining the relative merits of the proposals in accordance with the technical evaluation factors established by the Government prior to the receipt of proposals. The technical evaluation factors that will be considered and numerically weighted and scored are identified as follows in descending order of importance.

M2.1.1 *Operating/Management Plan* will be evaluated to assess the offeror's approach to effectively planning and providing support services to NSF, other USAP participant organizations, and NSF sponsored researchers.

M2.1.2 *Contractor Quality Control/Assurance* will be evaluated to assess the offeror's approach to systematically providing quality products and services, and the Government's ability to rely on the Contractor's representations upon completion of work.

M2.1.3 *Organizational Breakdown Structure and Key Personnel* will be evaluated to assess the offeror's approach to the structure and distribution of its personnel resources, and their quality and effectiveness in facilitating the performance of work.

M2.1.4 *Health and Safety* will be evaluated to assess the offeror's approach to providing a safe and healthy environment for its employees and other USAP participants.

M2.1.5 *Antarctic Environment* will be evaluated to assess the offeror's understanding and approach relative to Antarctic environmental protection.

M2.2 Cost/Price Evaluation

The Offerors' estimated costs/price will be evaluated to assess the realism of the proposed costs, and determine the probable cost/price to the Government. The cost/price factor will not be weighted or scored. The cost/price factor may be used as an aid in evaluating the offeror's understanding of the work requirement.

M2.3 Past Performance Evaluation

Proposals received in response to this solicitation will be reviewed and evaluated by a performance risk analysis committee. The evaluation will be conducted for the purpose of assessing the potential risk of contracting with the

offeror in accordance with the past performance factor established by the Government prior to the receipt of proposals. The past performance factor will not be numerically weighted and scored. Rather, an adjectival rating of *low*, *medium*, or *high* will be assigned.

Past Performance will be evaluated to assess the offeror's performance under existing and prior contracts for similar services. This includes, but is not limited to: quality of product or service; timeliness of performance; knowledge level of workers; supervision during performance; dependability of workers; cost control, business relations; and customer satisfaction.

M2.4 Other Factors Evaluation

Other factors, as follow, shall be reviewed and evaluated by the business management panel from information collected from the offeror's proposal, and obtained from Government and other sources. Other factors will not be weighted nor scored. Rather an adjectival rating of *plus*, *neutral*, or *minus* will be assigned to each factor.

M2.4.1 *Financial condition and capability* will be evaluated to determine if the offeror is able to undertake work associated with a requirement of this type and magnitude.

M2.4.2 *Contract management experience and past performance* will be evaluated regarding the extent to which similar (type, size, services) contracts have been successfully managed and work performed thereunder.

M2.4.3 *Contract deviation* will be evaluated regarding the extent of proposed deviations from the solicitation, and the rational for the same.

M2.4.4 *Work priority* will be evaluated regarding the extent of the organization's commitments, and possible conflict with NSF's requirement.

M2.4.5 *Small Business and Small and Disadvantaged Business Subcontracting Goals* will be evaluated to assess the degree of participation by these businesses, and the contribution to accomplishing the National Science Foundation's goals in this area.

M2.4.6 *Limitation on Costs Related to Legal and Similar Matters* will be evaluated to assess the offeror's commitment to share the Government's risk in this area and conduct its business in an appropriate manner.

M2.4.7 *Government Approved Administrative Systems* will be evaluated to assess the offeror's ability to perform in accordance with established Government administrative requirements.

M3. FAR PROVISIONS INCORPORATED BY REFERENCE

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE. (JUN. 1988)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

52.217-5 EVALUATION OF OPTIONS JUL 1990

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